ORDER NO. SD82032145C2

Service Manual

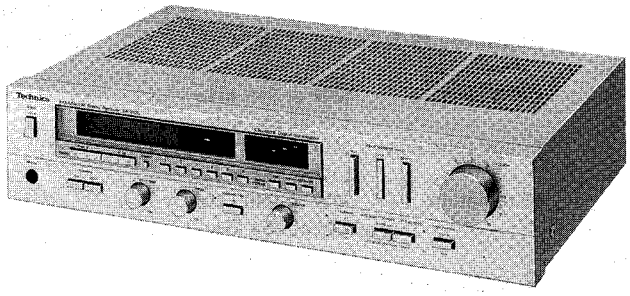
FM/MW/LW Stereo Receiver

SA-212L

[EX], [EF], [EB], [EK]

SA-212L(K)

[EX]



* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Areas

* [EX] is available in Switzerland and Scandinavia.
* [EF] is available in France.
* [EB] is available in Belgium.
* [EK] is available in United Kingdom.

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	
both channels driven	2 × 25W (4Ω)
	2 × 25W (8Ω)
40 Hz~16 kHz continuous power output	
both channels driven	2 × 25W (4Ω)
	2 × 25W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 30W (4Ω)
	2 × 27W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.08% (4Ω)
	0.04% (8Ω)
rated power at 40 Hz~16 kHz	0.08% (4Ω)
	0.04% (8Ω)
rated power at 1 kHz	0.04% (4Ω)
	0.04% (8Ω)
half power at 1 kHz	0.009% (8Ω)
−26 dB power at 1 kHz	0.1% (4Ω)
50 mW power at 1 kHz	0.12% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.08%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.04%
Power bandwidth	
both channels driven, −3 dB	10 Hz~30 kHz (4Ω)
Damping factor	15 (4Ω), 30 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
AUX	150 mV/22kΩ
TAPE	150 mV/22kΩ
TAPE REC/PLAY	180 mV/22kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
Frequency response	
PHONO	RIAA standard curve
	±0.8 dB (30 Hz~15 kHz)
AUX, TAPE	7 Hz~70 kHz (−3 dB)
S/N	
rated power (4Ω)	
PHONO	70 dB (IHF, A: 80 dB)
AUX, TAPE	88 dB (IHF, A: 95 dB)
−26 dB power (4Ω)	
PHONO	64 dB
AUX, TAPE	66 dB
50 mW power (4Ω)	
PHONO	62 dB
AUX, TAPE	62 dB
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Subsonic filter	30 Hz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage and impedance	
TAPE, REC OUT	150 mV
TAPE REC/PLAY	30 mV/82kΩ
Channel balance, AUX 250 Hz~6,300 Hz	±1 dB
Channel separation, AUX 1 kHz	55 dB
Headphones output level and impedance	300 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz (0.05 MHz step)
	87.9~107.9 MHz (0.2 MHz step)
Sensitivity	
S/N 30 dB	1.9 μV (300Ω), 1.3 μV (75Ω)
S/N 26 dB	1.7 μV (300Ω), 1.2 μV (75Ω)
S/N 20 dB	1.5 μV (300Ω), 0.9 μV (75Ω)
IHF usable sensitivity	1.9 μV (IHF '58)
IHF 46 dB stereo quieting sensitivity	22 μV/75Ω
Total harmonic distortion	
MONO	0.08%
STEREO	0.15%

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P.O. Box 288, Central Osaka Japan

S/N	
MONO	65 dB (78 dB, IHF)
STEREO	58 dB (72 dB, IHF)
Frequency response	20 Hz~15 kHz, +1 dB~ −2 dB
Alternate channel selectivity	
wide	±400 kHz, 70 dB
Capture ratio	1 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	75 dB
Spurious response rejection at 98 MHz	82 dB
AM suppression	55 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	−35 dB (−35 dB, IHF)
38 kHz	−50 dB (−50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1,000 kHz
Antenna terminals	300Ω (balanced) 75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range		
MW		522~1611 kHz (9 kHz step), 530~1620 kHz (10 kHz step)
LW		155~353 kHz (normal), 153~351 kHz (−2 kHz shift)
Sensitivity (S/N 20 dB)	**MW**	20 μV, 300 μV/m
	LW	45 μV
Selectivity	**MW at 999 kHz**	55 dB
	LW at 254 kHz	55 dB
Image rejection	**MW at 999 kHz**	40 dB
	LW at 254 kHz	40 dB
IF rejection	**MW at 999 kHz**	50 dB
	LW at 254 kHz	45 dB

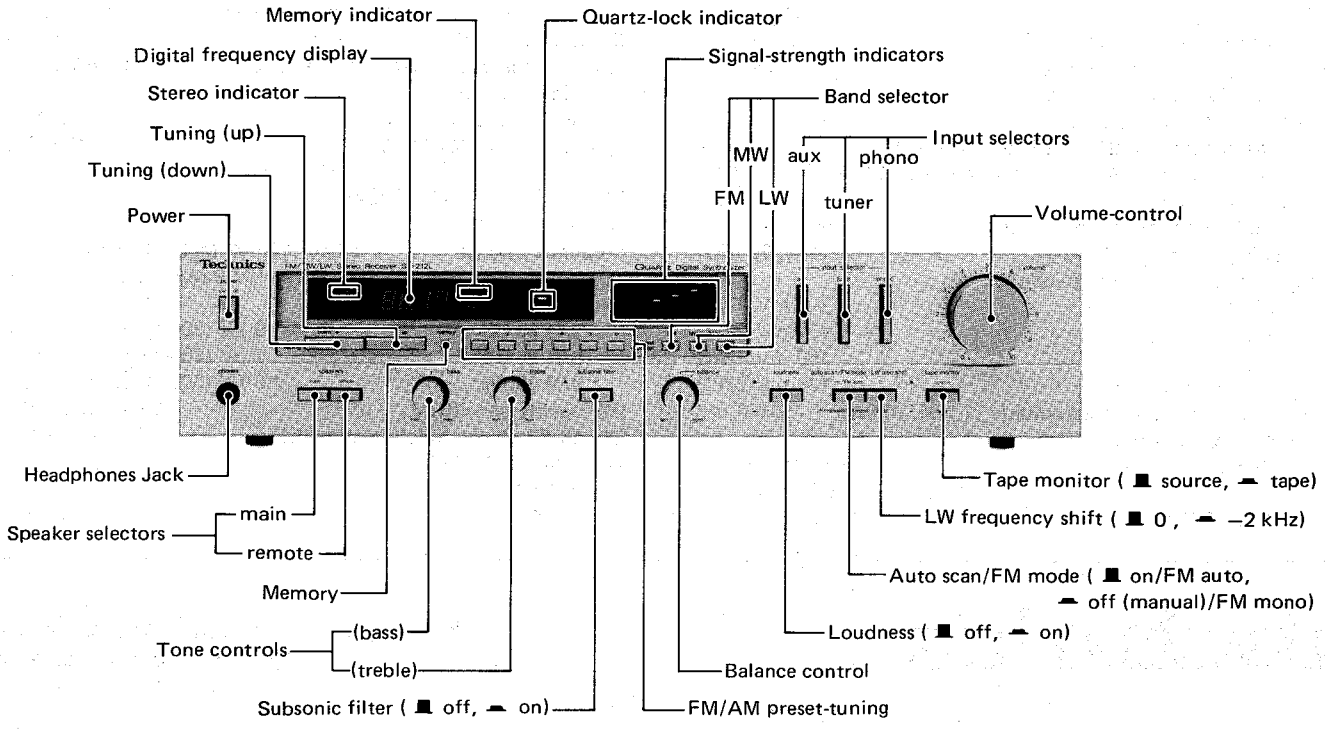
■ GENERAL

Power consumption	240W
Power supply	AC 50 Hz/60 Hz, 240V (For United Kingdom) AC 50 Hz/60 Hz, 220V (For continental Europe)
Dimensions (W×H×D)	430 × 97 × 300 mm (16-15/16" × 3-13/16" × 11-13/16")
Weight	6 kg (13.2 lb.)

■ CONTENTS

LOCATION OF CONTROLS 2, 3
PROTECTION CIRCUITRY 4
BEFORE REPAIR AND ADJUSTMENT 4
DISASSEMBLY INSTRUCTIONS 4, 5
REPLACEMENT PARTS LIST
Electrical Parts 6
Resistor & Capasitor . . . . . 13 ~ 17
Cabinet & Chassis Parts 27
CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM . . . . . 7 ~ 9
BLOCK DIAGRAM . . . . . 10 ~ 12
SCHEMATIC DIAGRAM . . . . . 18 ~ 22
MEASUREMENTS AND ADJUSTMENTS 23, 24
EXPLODED VIEWS 25, 26
PACKINGS 27

■ LOCATION OF CONTROLS



ORDER NO. SD82032145C2-A

FM/MW/LW
Stereo Receiver

SA-212L/SA-212L(K)

- This booklet contains the specifications and adjusting procedures for SA-212L, written in French and Spanish.
- File this manual together with the SA-212L service manual (Order No. SD82032145C2).

DEUTSCH

■ TECHNISCHE DATEN

(Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 25W (4 Ω)
	2 × 25W (8 Ω)
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 25W (4 Ω)
	2 × 25W (8 Ω)
Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 30W (4 Ω)
	2 × 27W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,08% (4 Ω)
	0,04% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,08% (4 Ω)
	0,04% (8 Ω)
Nennleistung bei 1 kHz	0,04% (4 Ω)
	0,04% (8 Ω)
halbe Nennleistung bei 1 kHz	0,009% (8 Ω)
−26 dB Leistung bei 1 kHz	0,1% (4 Ω)
50 mW Leistung bei 1 kHz	0,12% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,08%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,04%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei −3 dB	10 Hz ~ 30 kHz (4 Ω)
Dämpfungsfaktor	15 (4 Ω), 30 (8 Ω)
Eingangsempfindlichkeit und -impedanz	
Phono	2,5 mV/47 kΩ
Aux	150 mV/22 kΩ
Tape	150 mV/22 kΩ
Tape Aufnahme/Wiedergabe (TAPE REC/PLAY)	180 mV/22 kΩ
Maximale TA-Eingangsspannung (1 kHz, eff.)	150 mV
Geräuschabstand	
Nennleistung (4 Ω)	
Phono	70 dB (nach IHF, A: 80 dB)
Aux, Tape	88 dB (nach IHF, A: 95 dB)
−26 dB Leistung (4 Ω)	
Phono	64 dB
Aux, Tape	66 dB
50 mW Leistung (4 Ω)	
Phono	62 dB
Aux, Tape	62 dB
Frequenzgang	
Phono	RIAA-Standardkurve
	±0,8 dB (30 Hz ~ 15 kHz)
Aux, Tape	7 Hz ~ 70 kHz(−3 dB)
Klangregler	
Baßregler (BASS)	50 Hz, +10 dB ~ −10 dB
Höhenregler (TREBLE)	20 kHz, +10 dB ~ −10 dB
Tiefenfilter	30 Hz, −6 dB/Okt.
Gehörrichtige Lautstärkekorrektur (Loudness)	
(bei −30 dB Ausgangsleistung)	50 Hz, +9 dB
Ausgangsspannung und -impedanz	
Tape Aufnahme (TAPE, REC OUT)	150 mV
Tape Aufnahme/Wiedergabe (TAPE REC/PLAY)	30 mV/82 kΩ
Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)	±1 dB
Übersprechdämpfung (Aux, 1 kHz)	55 dB
Kopfhörerpegel und -impedanz	300 mV/330 Ω
Lautsprecherimpedanz	
MAIN oder REMOTE	4 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz
Eingangsempfindlichkeit	
S/R 30 dB	1,9 μV (300 Ω), 1,3 μV (75 Ω)
S/R 26 dB	1,7 μV (300 Ω), 1,2 μV (75 Ω)
S/R 20 dB	1,5 μV (300 Ω), 0,9 μV (75 Ω)
Nutzempfindlichkeit nach IHF	1,9 μV (nach IHF '58)
Stereoumschaltschwelle bei 46 dB nach IHF	22 μV/75 Ω
Gesamtklirrfaktor	
Mono	0,08%
Stereo	0,15%
Geräuschabstand	
Mono	65 dB (78 dB nach IHF)
Stereo	58 dB (72 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+1 dB ~ −2 dB)
Trennschärfe bei Störsender	
breit	±400 kHz, 70 dB
Einfangverhältnis	1 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
ZF-Dämpfung bei 98 MHz	75 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	82 dB
AM-Unterdrückung	55 dB
Übersprechdämpfung	
1 kHz	40 dB
10 kHz	30 dB
Trägerrest	
19 kHz	−35 dB (−35 dB nach IHF)
38 kHz	−50 dB (−50 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,5 dB
Begrenzereinsatz	1,2 μV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1.000 kHz
Antennenanschluß	300 Ω (symmetrisch)
	75 Ω (unsymmetrisch)

■ AM-TUNERTEIL

Wellenbereiche		
MW		522 ~ 1611 kHz (9 kHz-Schritte)
		530~1620 kHz (10 kHz-Schritte)
LW		155 ~ 353 kHz (normal)
		153~351 kHz (−2 kHz shift)
Eingangsempfindlichkeit (S/R 20 dB)		
MW		20 μV, 300 μV/m
LW		45 μV
Trennschärfe	**MW bei 999 kHz**	55 dB
	LW bei 254 kHz	55 dB
Spiegelfrequenz-Dämpfung	**MW bei 999 kHz**	40 dB
	LW bei 254 kHz	40 dB
ZF-Dämpfung	**MW bei 999 kHz**	50 dB
	LW bei 254 kHz	45 dB

■ ALLGEMEINE DATEN

Leistungsaufnahme	240 W
Netzspannung	Wechselstrom AC 50 Hz/60 Hz, 220V
	(Für Kontinentaleuropa)
	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
	(Für andere Länder)
Abmessungen (B×H×T)	430 × 97 × 300 mm
Gewicht	6 kg

■ EINSTELLUNGSANWEISUNGEN

AM-EINSTELLUNG

*** Stellungen und zu benutzende Geräte**

1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM)
2. AM (MW)-Meßsender (AM-SG)
3. Bereichsschalter . . . . . MW oder LW.
4. AM Wellenverteilunas-Wahlschalter auf Position "10 kHz" stellen.
5. Netzspannung auf ihren Sollwerthalten.
6. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
7. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.

Nr.	AM (MW)-MESSENDER ANSCHLUSS	AM (MW)-MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	MW-HF-ABGLEICH			* Bandwahlschalter in die "MW"-position stellen.		
1	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	610 kHz (400 Hz Modulat., 30%)	610 KHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	T201 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von T201 mit einem Schraubendreher justieren.
2		1500 kHz (400 Hz Modulat., 30%)	1500 kHz		CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (1) und (2) wiederholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.
	LW-HF-ABGLEICH			* Bandwahlter in die "LW"-position stellen.		
3	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	155 kHz (400 Hz Modulat., 30%)	155 kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	T203 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von T203 mit einem Schraubendreher justieren.
4		353 kHz (400 Hz Modulat., 30%)	353 kHz		CT202 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (3) und (4) wiederholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.

FM (UKW)-EINSTELLUNG

*** Stellungen und zu benutzenden Geräte**

1. UKW-Meßsender (FM-SG)
2. Stereo-Modulator (oder Trennmesser)
3. Verzerrungsmesser
4. Oszilloskop
5. Elektronische Voltmeter für Wechsel-und Gleichstrom (VTVM).
6. Signalfrequenzmesser (meßar für 19 kHz und 108 MHz)
7. UKW 300-Ohm Kunstantenne (Abb. 8)
8. Den Eingangswähler auf die "FM"-position stellen.
9. Den Auto-Scan/UKW-Betriebsart-Wahlschalter in die Position "off (manual) FM mono" stellen.
10. Die anderen Einstellungen sind gleich wie beider MW-Justierung.

*** Vorbereitung AM UKW-Messender (FM-SG)**

1. SG-Ausgang über 300-Ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen.
2. Den normale Eingang des Gerätes beträt 60 dB (1mV), 400 Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signalausgang 12 dB plus (IHF) sein: d.h. beim Eingang von 60 dB soll der Signalausgang 72 dB sein.)

	FM (UKW)-MESSENDER ANSCHLUSS	FM (UKW)-MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	UKW-ZF-ABGLEICH					
5	——	Kein Signal	100.1 MHz	Ein Gleichstromrören-voltmeter zwischen **TP101** und **TP102** über eine Drosselspule verbinden. (Siehe Abb. 9)	T101 (Diskriminator FT)	Den Kern von T101 so justieren, daß die gemessene Spannung im signal Modus 0mV im 300mV Bereich beträgt.
	ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
6	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (60 dB in den Antenneneingang leiten.)	100.1 MHz (400 Hz Modulat., 100%)	100.1 MHz	Klirrfaktor-Meßbrücke über den Lautsprecher schließen.	T102 (Diskriminator FT)	1. Schritt (3) im empfangsfreien Zustand prüfen. 2. Falls eine Abweichung vorhanden ist, T101 erneut abgleichen. 3. T102 Kern für minimale Verzerrung der rechten und linken Kanäle justieren.
	UKW-MPX-PILOTABGLEICH (VCO)					
7	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Mono-Signal)	100.1 MHz (Modulierte Welle)	100.1 MHz	Den Signalfrequenz-messer durch 100kΩ Widerstand an Anschluß **TP301** anschließen.	VR301 (VCO)	1. Den Auto-Scan/UKW-Betriebsart-Wahlschalter in die Position "on/FM auto" stellen. 2. VR301 auf 19 kHz ± 30 Hz einstellen.

FRANÇAIS

■ CARACTERISTIQUES (Sujet á changement sans préaris.)

■ SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz, les deux canaux en circuit	2 × 25W (4Ω) 2 × 25W (8Ω)
Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit	2 × 25W (4Ω) 2 × 25W (8Ω)
Puissance de sortie continue à 1 kHz les deux canaux en circuit	2 × 30W (4Ω) 2 × 27W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,08% (4Ω) 0,04% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,08% (4Ω) 0,04% (8Ω)
à puissance nominale (1 kHz)	0,04% (4Ω) 0,04% (8Ω)
à demi-puissance (1 kHz)	0,009% (8Ω)
puissance de −26 dB à 1 kHz	0,1% (4Ω)
puissance de 50 mW à 1 kHz	0,12% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,08%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,04%
Réponse de fréquences les deux canaux en circuit, −3 dB	10 Hz~30 kHz (4Ω)
Coefficient d'amortissement	15 (4Ω), 30 (8Ω)
Sensibilité et impédance d'entrée	
PHONO	2,5 mV/47kΩ
AUX (AUX)	150 mV/22kΩ
BANDE (TAPE)	150 mV/22kΩ
BANDE ENREGISTREMENT/LECTURE (TAPE REC/PLAY)	180 mV/22kΩ
PHONO (tension d'entrée maximum, 1 kHz RMS)	150 mV
Signal/Bruit	
à puissance nominale (4Ω)	
PHONO	70 dB (IHF, A: 80 dB)
AUX, BANDE (AUX, TAPE)	88 dB (IHF, A: 95 dB)
puissance de −26 dB (4Ω)	
PHONO	64 dB
AUX, BANDE (AUX, TAPE)	66 dB
puissance de 50 mW (4Ω)	
PHONO	62 dB
AUX, BANDE (AUX, TAPE)	62 dB
Réponse de fréquence	
PHONO	Courbe nominale RIAA ±0,8 dB (30 Hz~15 kHz)
AUX, BANDE (AUX, TAPE)	7 Hz~70 kHz (−3 dB)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ −10 dB
Filtre subsonique	30 Hz, −6 dB/oct.
Compensateur physiologique (volume à −30 dB)	50 Hz, +9 dB
Tension de sortie et impédance	
SORTIE ENREGISTREMENT/BANDE (TAPE, REC OUT)	150 mV
ENREGISTREMENT/LECTURE BANDE (TAPE REC/PLAY)	30 mV/82kΩ
Equilibrage des canaux, AUX 250 Hz~6 300 Hz	±1 dB
Séparation des canaux, AUX 1 kHz	55 dB
Niveau de sortie des casques et impédance	300 mV/330Ω
Impédance de charge	
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	4Ω~16Ω
PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)	8Ω~16Ω

■ SECTION SYNTONISATEUR FM

Gamme de fréquence	87,50~108,00 MHz (0,05 MHz par palier) 87,9~107,9 MHz (0,2 MHz par palier)
Sensibilité	
S/B 30 dB	1,9 μV (300Ω), 1,3 μV (75Ω)
S/B 26 dB	1,7 μV (300Ω), 1,2 μV (75Ω)
S/B 20 dB	1,5 μV (300Ω), 0,9 μV (75Ω)
Sensibilité utilisable IHF	1,9 μV (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μV/75Ω
Distorsion harmonique totale	
MONO	0,08%
STEREO	0,15%
Signal/Bruit	
MONO	65 dB (78 dB, IHF)
STEREO	58 dB (72 dB, IHF)
Réponse de fréquence	20 Hz~15 kHz, +1 dB~ −2 dB
Sélectivité alternée par canal	
Large	±400 kHz, 70 dB
Taux de capture	1 dB
Rejection d'image à 98 MHz	55 dB
Rejection FI à 98 MHz	75 dB
Rejection de réponse parasite à 98 MHz	82 dB
Suppression AM	55 dB
Séparation stéréophonique	
1 kHz	40 dB
10 kHz	30 dB
Fuite de porteuse	
19 kHz	−35 dB (−35 dB, IHF)
38 kHz	−50 dB (−50 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	±1,5 dB
Point de limite	1,2 μV
Largeur de bande	
Amplificateur FI	180 kHz
Démodulateur FM	1.000 kHz
Bornes d'antenne	300Ω (symétrique) 75Ω (asymétrique)

■ SECTION SYNTONISATEUR AM

Gamme de fréquence		
PO (MW)		522~1611 kHz (9 kHz par palier), 530~1620 kHz (10 kHz par palier)
GO (LW)		155~353 kHz (normal), 153~351 kHz (−2 kHz shift)
Sensibilité (S/B 20 dB)	**PO (MW)**	20 μV, 300 μV/m
	GO (LW)	45 μV
Sélectivité	**PO (MW) à 999 kHz**	55 dB
	GO (LW) à 254 kHz	55 dB
Réjection d'image	**PO (MW) à 999 kHz**	40 dB
	GO (LW) à 254 kHz	40 dB
Réjection FI	**PO (MW) à 999 kHz**	50 dB
	GO (LW) à 254 kHz	45 dB

■ DIVERS

Consommation	240W
Alimentation	CA 50 Hz/60 Hz, 220V (Pour l'Europe) CA 50 Hz/60 Hz, 110V/120V/220V/240V (Autres)
Dimensions (L×H×Pr)	430 × 97 × 300 mm
Poids	6 kg

Nota:
La Société NATIONAL-PANASONIC-FRANCE, importateur du matériel MATSUSHITA-ELECTRIC déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. (arrêté 14 Janvier 1980).

■ MESURAGES ET RÉGLAGES

RÉGLAGE DE AM

• Réglage et équement utilisé

1. Voltmètres électronique de courant altèrnatif et de courant continu (VTVM)
2. Générateur du signal AM (AM-SG)
3. Sélecteur de gamme . . . . . { AM (Alignement MW/LW) / FM (Alignement FM)
4. Régler le sélecteur d'attribution AM sur la position "10kHz".
5. Conservel la tension du secteur à la tension nominale.
6. Le signal du générateur ne doit pas étre plus élvé qu'il n'est nécessaire à obtenir une lecture en sortie.
7. Utiliser un tournevis non-métallique pour la réglage.

No.	AM GENERATEUR BRANCHEMENT	AM GENERATEUR FREQUENCE	FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	REGLAGE DE RF-MW			*Régler le commutateur de gammes d'ondes sur la position "MW"		
1	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	610kHz (modulé à 30% par 400Hz)	610kHz	Branchez un c.a. voltmètre électronique ou nu oscilloscope sur les bornes de haut-parleur	T201 (Bobine Ant.)	1. Régler au maximum de signal de sortie. 2. Régler le noyau ferrite de T201 à l'aide d'un tournevis.
2		1500kHz (modulé à 30% par 400Hz)	1500kHz		CT201 (Trimmer Ant.)	1. Régler au maximum de signal de sortie. 2. Refaire les étapes (1) et (2) jusqu'à ce que le fréquence s'aligne correctement avec l'affichage du cadran.
	REGLAGE DE RF-MW			*Régler le commutateur de gammes d'ondes sur la position "LW"		
3	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	155 kHz (modulé à 30% par 400 Hz)	155 kHz	Branchez un c.a. voltmètre électronique ou nu oscilloscope sur les bornes de haut-parleur.	T203 (Bobine Ant.)	1. Régler au maximum de signal de sortie. 2. Régler le noyau ferrite de T203 à l'aide d'un tournevis.
4		353 kHz (modulé à 30% par 400 Hz)	353 kHz		CT202 (Trimmer Ant.)	1. Régler au maximum de signal de sortie. 2. Refaire les étapes (3) et (4) jusqu'à ce que le fréquence s'aligne correctement avec l'affichage du cadran.

RÉGLAGE DE FM

• Réglage et équipement untilisé

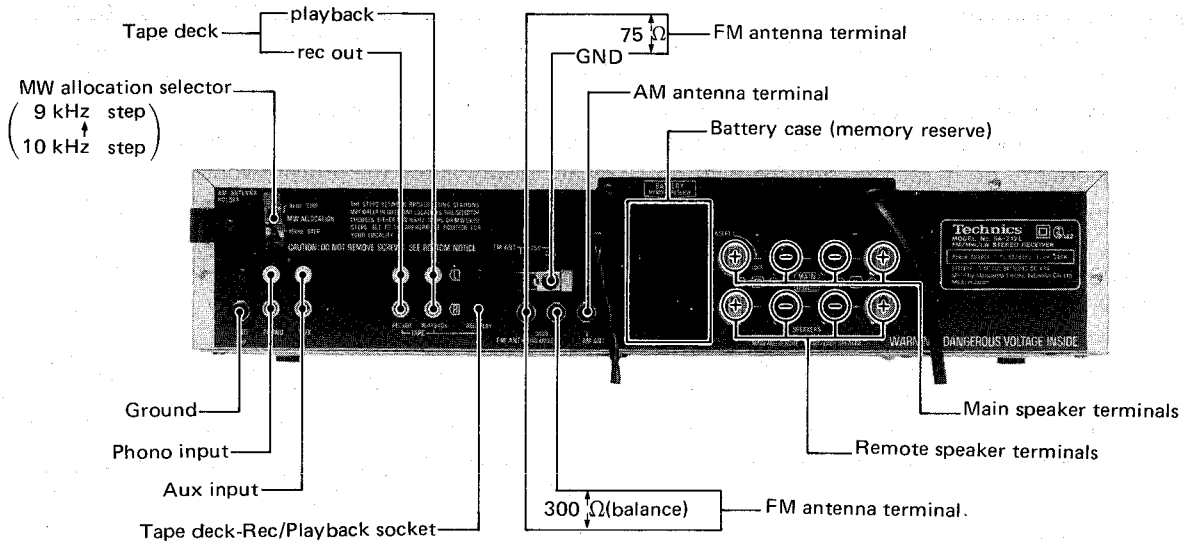
1. Générateur du signal FM (FM-SG).
2. Commande de réglage stéréophonique (ou vu-mètre de séparation).
3. Jauge de distorsion.
4. Oscilloscope.
5. Voltmètres électronique de courant alternatif et de courant continu (VTVM).
6. Compteur de fréquence (19kHz et 108MHz mesurable).
7. Antenne fictive FM, 300 ohms (Fig. 8)
8. Sélecteur . . . . . FM (Alignement FM)
9. Placer le sélecteur de mode d'Exploration automatique/FM sur la position "off (manual)/FM mono".
10. Les autres réglages sont les mêmes que pour la mise au point de l'amplitude modulée (AM).

• Préparation du générateur de signal FM (FM-SG)

1. Alimenter la sortie SG à la borne de l'antenne de l'appareil, par l'antenne fictive FM, 300 ohms.
2. L'éntrée standard de l'appareil est de 60dB (1mV), 400Hz, 100% de modulation (à cause de l'utilisation de l'antenne fictive, la sortie SG doit être de plus 12dB (IHF). Ce qui signifie que guand l'entrée est de 60dB, la sortie SG doit être de 72dB.)

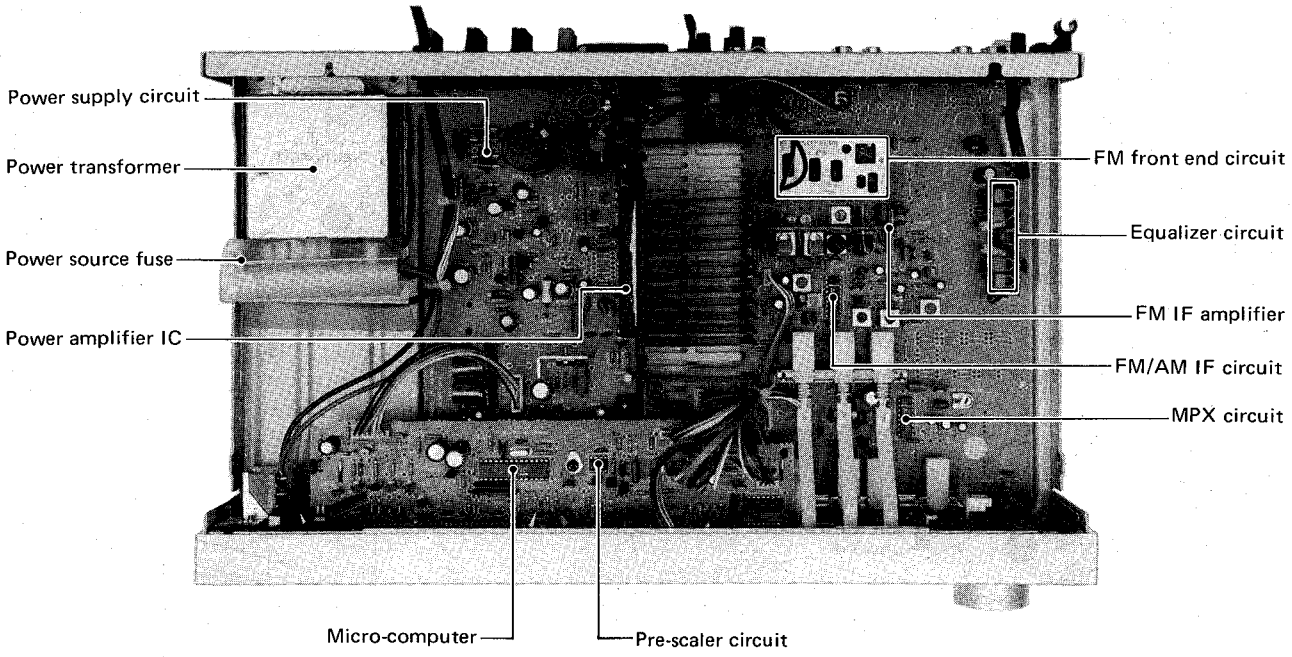
No.	FM GENERATEUR BRANCHEMENT	FM GENERATEUR FREQUENCE	FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	REGLAGE DE FI-FM					
5	———	Sans Signal	100.1MHz	Brancher le voltmètre électronique a c.c. aux bornes **TP101** et **TP102**. (Voir la Fig. 9)	T101 (Transfor FI discri.)	Régler le noyau T101 de telle sorte que le voltage mesuré dans le mode sans signal, soti de 0mV dans la gamme des 300mV.
	REGLAGE DE LA DISTORSION FM EN MONO					
6	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Niveau de sortie du générateur 60dB)	100.1MHz (modulé à 100% par 400Hz)	100.1MHz	Branchez un distortion métre sur les bornes de haut-parleur de appareil.	T102 (Transfor FI discri.)	1. Vérifier à l'étape (3) s'il n'y a pas de mode de signal 2. S'il est dévié, régler à nouveau T101. 3. Régler le noyou T102 de telle sorte que la distortion des canaux droit et gauche soit la plus faible.
	REGLAGE (VCO) PILOTE MULTIPLEX FM					
7	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal monoscoustique.)	100.1MHz (Non modulé)	100.1MHz	Brancher le compteur de fréquences à la borne **TP301** par l'intermédiaire d'une résistance de 100kΩ.	VR301 (VCO)	1. Placer le sélecteur de mode d'Exploration automatique/FM sur "on/FM auto". 2. Régler VR301 sur 19kHz ± 30Hz.

Printed in Japan
82043700 Ⓗ SH



*** The power supply for this unit varies depending upon the areas.**
- **220V (50/60 Hz) for Continental Europe.**
- **240V (50/60 Hz) for United Kingdom.**

*** Phono input capacitance is about 150pF.**



■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlined below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

■ BEFORE REPAIR AND ADJUSTMENT

Turn off the power supply and short-circuit both ends of power supply condensers (C702, C703, 6800μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Avoid short-circuit with a screwdriver or the like otherwise the transistors or diodes may break down. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a voltage requlator to make sure that the current consumed is free of abnormality.

The current consumed at 60 Hz/50 Hz in no-signal mode is shown below with respect to supply voltage 220V/240V.

Power supply voltage		220V	240V
Current consumed	50 Hz	70 ~ 250mA	60 ~ 200mA
	60 Hz	60 ~ 250mA	50 ~ 200mA

■ DISASSEMBLY INSTRUCTIONS

• How to remove the cabinet

1. Remove the 5 setscrews (Fig. 1 : ❶ ~ ❺) of the cabinet.
2. Remove the cabinet by raising it in the direction of the arrow (Fig. 1)

• How to remove the front panel

1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Disengage the two claws which hold the digital frequency display tube, and then slightly slant the digital frequency display tube as in Fig. 2.
3. Remove the 3 setscrews (Fig. 1 : ❻ ~ ❽) of the front panel.
4. Insert a screwdriver between the front panel and front chassis while lightly pressing the claw in the direction of arrow Ⓐ and raise the screwdriver upward in the direction of arrow Ⓑ (Fig. 2) to remove the front panel. (Take care not to damage the knob, switch etc.)

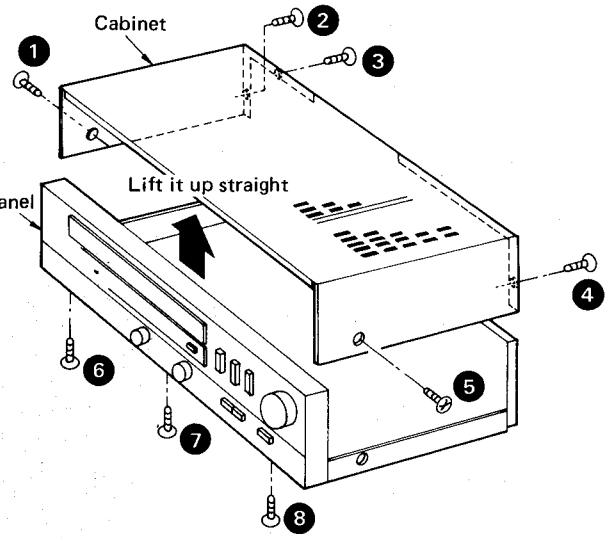


Fig. 1

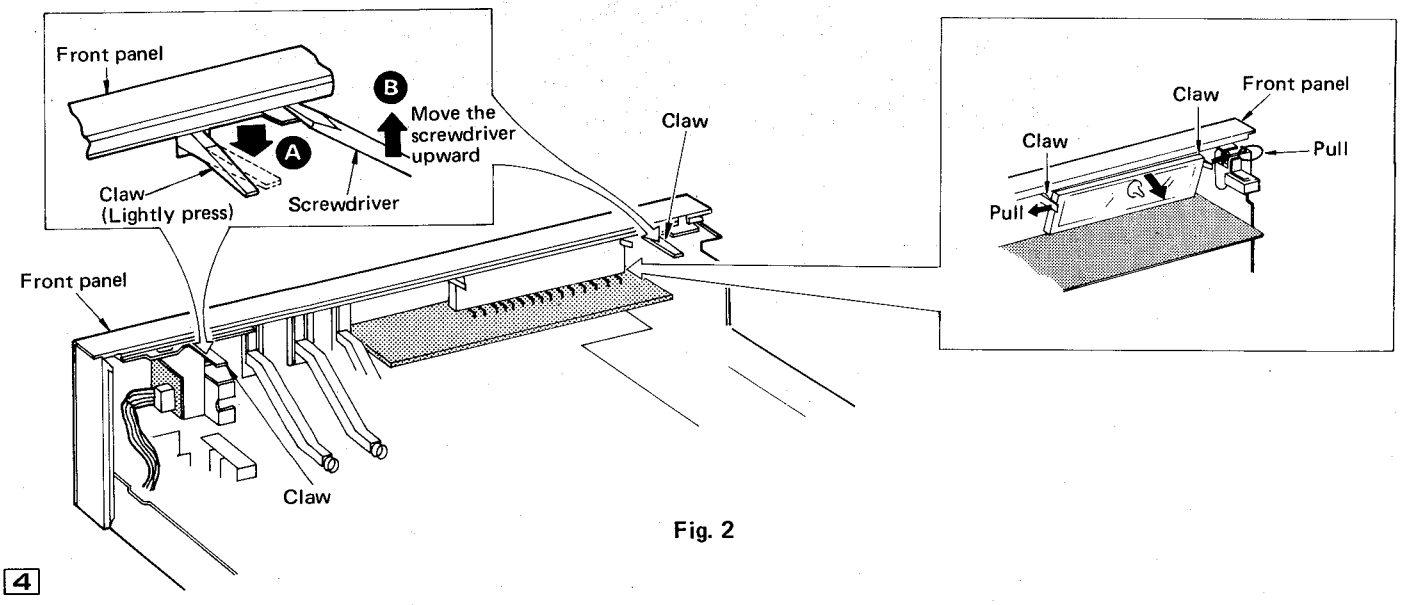


Fig. 2

• How to remove the power amplifier IC

1. Remove the cabinet. (Refer to the section. "How to remove the cabinet.")
2. Remove the 9 setscrews (Fig. 3 : ⑩ ~ ⑱) of the bottom board.
3. Remove the bottom board.
4. Remove the 2 setscrews (Fig. 4 : ⑲ , ⑳) to detach the power transformer from rear panel in the direction of arrow Ⓓ .
5. Unsolder of power IC.
6. Remove the 2 setscrews (Fig. 4 : ㉑ , ㉒) used to secure the power IC on the heat sink, and then pull the power IC.
7. When mounting the power IC, apply silicone compound (or equivalent heat diffuser) to the rear side of power IC, and then follow the steps 1 ~ 6 reversely.

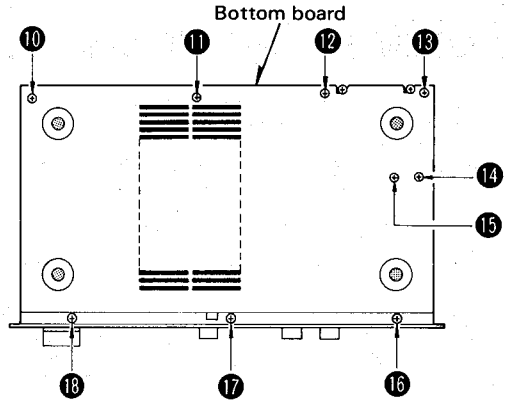


Fig. 3

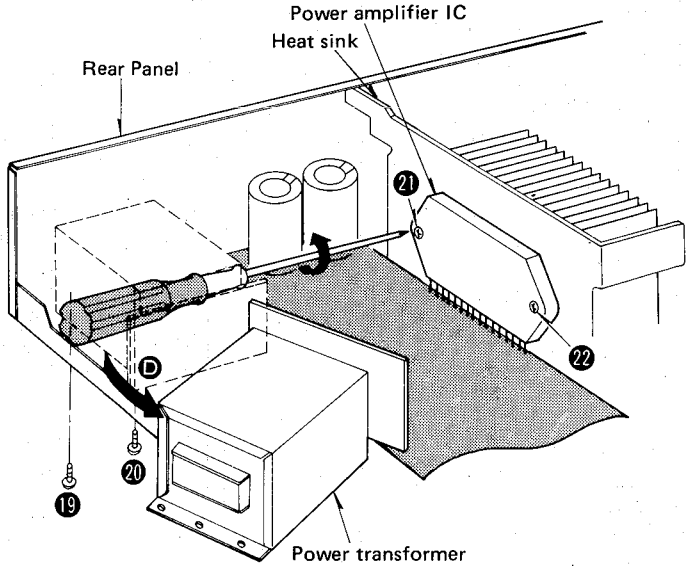


Fig. 4

• How to replace chips (resistor)

1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 5.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in Fig. 6.

Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

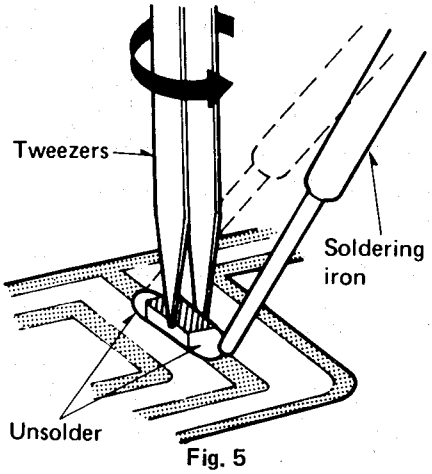


Fig. 5

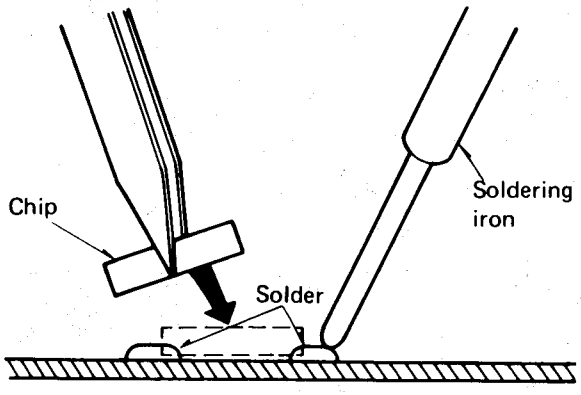


Fig. 6

• Note for replacing chips

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

• Precautions for repair

When frequency is not indicated, FL (display tube), FL driver, digit circuit, and micro-computer must be checked by oscilloscope.

In this case, take care not to allow short circuit between IC terminals or application of voltage from measuring instrument to IC terminals.

■ REPLACEMENT PARTS LIST... Electrical Parts

Notes.

1. Parts numbers are indicated on most mechanical parts. Please this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indicators in Ref. No. columns specify the area.
4. The " **S** " mark is service standard parts and may differ from production parts.

Areas

* [EX] is available in Switzerland and Scandinavia.
* [EF] is available in France.
* [EB] is available in Belgium.
* [EK] is available in United Kingdom.

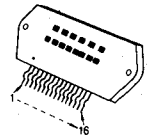
Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	SVINJM4562DD	Equalizer Amplifier
IC101	AN278	FM IF
IC102	AN7273	FM IF, AM Converter
IC301	SVIUPC1161C3	FM MPX
IC601	SVISTK4833M	Power
IC901	SVID1703C018	Micro-Computer
IC902	SVIUPB553AC	Pre-Scaler
IC951, 952	SVIUPD4011BC	NAND Gate
TRANSISTORS		
Q1 **S**	2SC945–Q	Switching
Q101 ~ 103, 201, 908, 909, 971	2SC1685–QNC	Switching, AM OSC. Buffer
Q104, 704 ~ 706, 905 ~ 907, 910 ~ 916, 972, 973	2SA1015–Y	Switching, Regulator, Driver
Q105, 901, 902, 951, 952	2SD661–S	Signal Driver, Loop Filter
Q701	2SD880–Y	Regulator
Q702, 703, 707	2SC1815–Y	Regulator
Q709, 710	2SA992–E	Regulator
Q971 ~ 975	2SD636	OSC
Q976	2SB641	Buffer
DIODES		
D101	MA27W–A	Switching
D102 **S**	MA162A	Switching
D103,	LN846RP	LED (Red)
D104 ~ 106	LN446YP	LED (Yellow)
D201	SVDKV1236Z	AM Variable Capacitor
D202, 251, 301, 302 **S**	MA162A	Switching
D701 ~ 704 **S** ⚠	SVDS2V20	Rectifier
D705, 710 **S** ⚠	SVDSR1K2	Rectifier
D706	SVDMZ327B	27V, Zener
D707, 708	SVDMZ316A	16V, Zener
D709	SVDMZ306C1	6V, Zener

Ref. No.	Part No.	Description
D711 ~ 714 **S** 903 ~ 905, 907 ~ 919, 923 951 ~ 960	MA162A	Switching
D715 **S**	RVDEQA0106S	6V, Zener
D921 **S**	2–OA99	Bias
D922	SVDMZ306B	6V, Zener
COILS		
L101	SLM1C61–P	Filter
L251	SLO1C17–P	LW OSC
L252	SLO2C31R–P	MW OSC
L253	SLQX101–3M	Choke
L601, 602	SLQY15G–30	Choke
TRANSFORMERS		
T101	SLI4C535–Z	FM IFT
T102	SLI4C537–Z	FM IFT
T201	SLA2C7–P	MW Antenna
T202	SLI2C141–M	AM IFT
T203	SLA1C15R–P	LW Antenna
T701 ⚠	SLT5M195	Power Source
T701 [EK] ⚠	SLT5M197	Power Source
CERAMIC FILTERS		
CF101, 102, 103	SVFE107MM-A	FM 10.7 MHz (Red)
	SVFE107MM-B	FM 10.6 MHz (Blue)
	SVFE107MM-C	FM 10.73 MHz (Orange)
CF201	SVFSFP450HT	AM 450 kHz (Use pair ranks as same as CF101 CF102 and CF103)
VARIABLE CAPACITORS		
CT201	SVCTZ03T110F	MW Antenna
CT202	ECV1ZW20X53N	LW Antenna
FM FRONT END		
	SNVFE306E05	FM RF Pack

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR301 **S**	EVNM4AA00B14	MPX. VCO, 10kΩ (B)
VR401	EWCXTAF20B15	Volume, 100kΩ (B)
VR402	EWH87A002G15	Balance, 100kΩ (G)
VR501	EWCXAA000C15	Bass, 100kΩ (C)
VR502	EWCX9A000012	Treble
COMPONENT COMBINATIONS		
Z301, 302	EXRP181K473C	47kΩ, 180pF
Z601, 602	ECQJ0517	0.047μF, 10Ω
Z701, 702	SXRFS203ZSM	0.01μF x 2
Z901, 902	EXBP87104K	100kΩ x 7
Z903	EXFP7331MH	330pF x 4
Z951	EXBP85104K	100kΩ x 5
CRYSTAL		
X901	SVQ43U452	4.5 MHz Counter Osc.
FLUORESCENT DISPLAY TUBE		
FL	SAD7MT29ZA	Digital Frequency Meter
FUSE		
F1 ⚠	XBA2C10TR0	250V, T 1A
SWITCHES		
S1 ~ 9, 11 ~ 13	SSG13	Preset, Tuning, Memory
S15	SSS43	FM and AM Allocation Selector
S16, 17 404, 406	SSH443	FM/AM, Auto Scam, Tape 1, Loudness
S401 ~ 403	SSH3039	Input Selector
S601, 602	SSH2017	Speaker Selector
S603	SSH165	Subsonic Filter
S701 [EX] ⚠	ESB822S	Power Source
S701 (Except for [EX]) ⚠	ESB90619S	Power Source

• Terminal guide of transistors, IC's and diodes

SVISTK4833M



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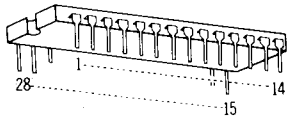

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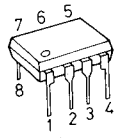
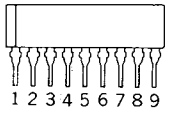


AN278



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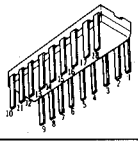

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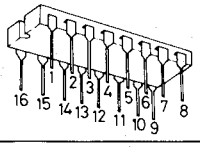

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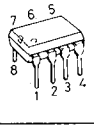
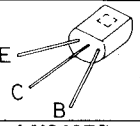


2SC945, 2SC1685, 2SA1015, 2SC1815, 2SA992



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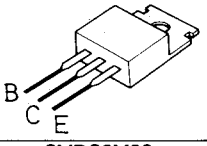

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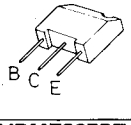
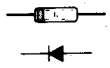


MA162A



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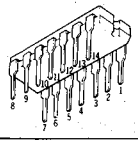

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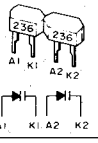

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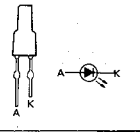
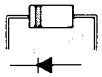


SVDS2V20 SVDSR1K2



SVDMZ327BTA, SVDMZ316ATA, SVDMZ306CTA, SVDMZ306BTA

SVDMZ

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines

TUNER CIRCUIT

GROUND POINT

GROUND PHONO AUX

TAPE REC OUT PLAYBACK

REC / PLAY

FM ANT 300Ω(Balance) 75Ω

AM ANT

AM 9kHz ⟷ AM 10kHz

S15 AM ALLOCATION SELECTOR

FM OFF-SET VOLTAGE TP102

EQUALIZER CIRCUIT

FM OFF-SET VOLTAGE TP101

To (201) ~ (208)

SUP2423IA FM FRONT-END BLOCK

(Battery memory reserve) 1.5V x 3

(AM loop antenna)

(Quartz lock ind.)

(Signal-strength ind.)

LOGIC/FL DRIVE CIRCUIT

TUNING (down) (up)

MEMORY (1) (2) (3)

PRESET-TUNING (4) (5) (6)

FM MW LW

REMOTE MAIN

SPEAK

VOLUME

TP301 19 kHz OUTPUT

TAPE MONITOR

LW SHIFT

AUTO SCAN/ FM MODE

LOUDNESS

BALANCE

SUBSONIC FILTER

TREBLE

SA-212L

Ground (Earth) lines

TAPE
REC OUT
PLAYBACK
REC / PLAY
FM ANT
300Ω (Balance)
75Ω
AM ANT
(Battery memory reserve)
1.5V X 3
SUP2423IA
FM FRONT-END BLOCK
(AM loop antenna)
(Quartz lock ind.)
(Signal-strength ind.)
PHONO
TUNER
AUX
LW SHIFT
AUTO SCAN/ FM MODE
LOUDNESS
BALANCE

LOGIC/FL DRIVE CIRCUIT

TUNING (down) (up)
MEMORY (1) (2) (3)
PRESET-TUNING (4) (5) (6)
FM
MW
LW

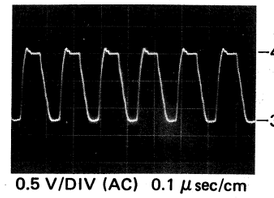
SPEAKER TERMINAL
REMOTE
MAIN

POWER ON-OFF
MUT/PROTECTION/
POWER AMP
CIRCUIT

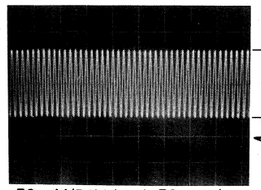
AC 220V
(50/60Hz)
T701
POWER
TRANSFORMER
POWER
Brown
White
Yellow
Skyblue
Blue

SUBSONIC FILTER
TREBLE
BASS
SPEAKERS SELECTOR
HEADPHONES

■ BLOCK DIAGRAM

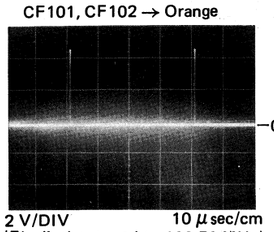


0.5 V/DIV (AC) 0.1 μsec/cm



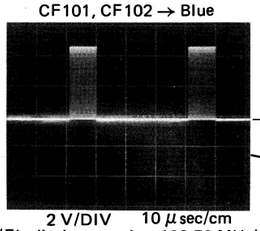
50 mV/DIV (AC) 50 nsec/cm

CF101, CF102 → Orange

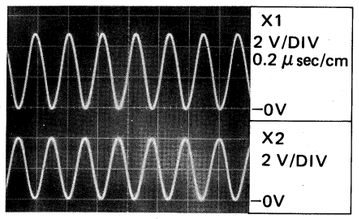


2 V/DIV 10 μsec/cm
(FL display tuned to 100.50 MHz)

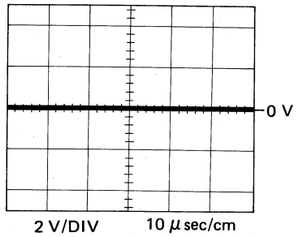
CF101, CF102 → Blue



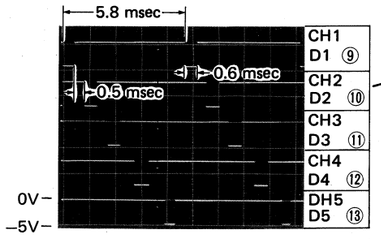
2 V/DIV 10 μsec/cm
(FL display tuned to 100.50 MHz)



CF101, CF102 → Red



2 V/DIV 10 μsec/cm
(FL display tuned to 100.50 MHz)



- **How to check FM front-end**

1. Check that the voltage at terminal ⑪ is DC 12.3V.
2. Check the waveform to see that the FM local oscillation circuit of terminal ⑬ is normal.
3. Check that the voltage at terminal ⑫ is DC 11.5V. (11.5V in FM and 0V in AM)
4. After cutting off the line between terminals ⑫ and CF101 terminal ①.
   Make sure that the output waveform is Fig. 7 when the signal of FM-SG (10.7 MHz, 400 Hz, 26 dB) is directly applied to terminal ① of CF101.

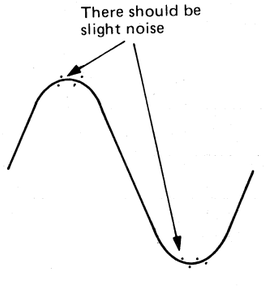
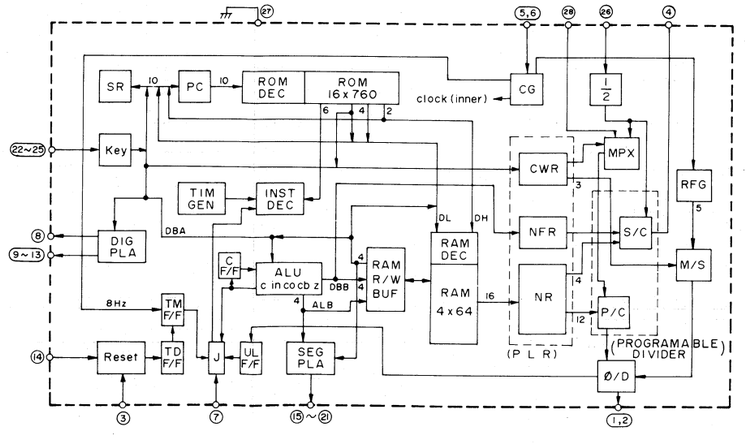
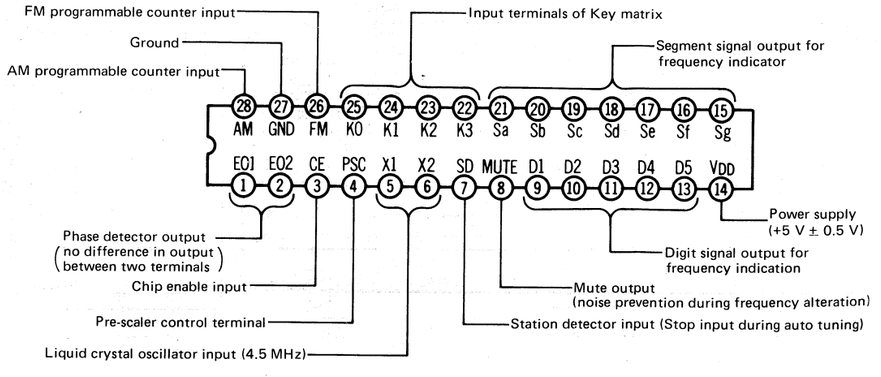


Fig. 7

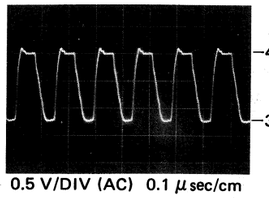
- **Block diagram of SVID1703CO18 (IC901)**



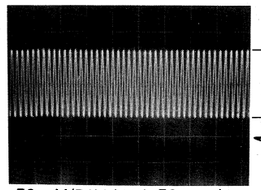
- **Description of IC terminal function (SVID1703C018)**


FM programmable counter input
Ground
AM programmable counter input
Input terminals of Key matrix
Segment signal output for frequency indicator
AM GND FM KO K1 K2 K3 Sa Sb Sc Sd Se Sf Sg
EO1 EO2 CE PSC X1 X2 SD MUTE D1 D2 D3 D4 D5 VDD
Power supply (+5 V ± 0.5 V)
Phase detector output (no difference in output between two terminals)
Digit signal output for frequency indication
Chip enable input
Mute output (noise prevention during frequency alteration)
Pre-scaler control terminal
Station detector input (Stop input during auto tuning)
Liquid crystal oscillator input (4.5 MHz)

■ BLOCK DIAGRAM

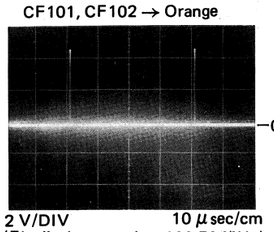


0.5 V/DIV (AC) 0.1 μsec/cm



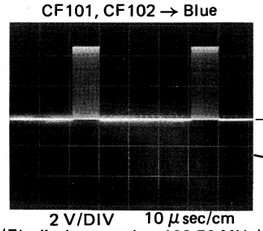
50 mV/DIV (AC) 50 nsec/cm

CF101, CF102 → Orange



2 V/DIV 10 μsec/cm
(FL display tuned to 100.50 MHz)

CF101, CF102 → Blue



2 V/DIV 10 μsec/cm
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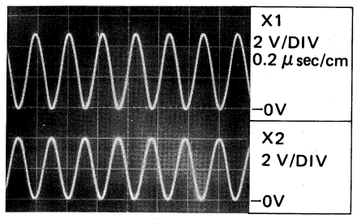
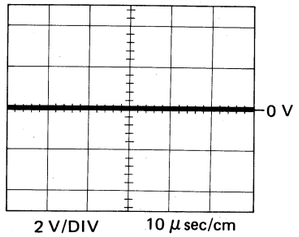
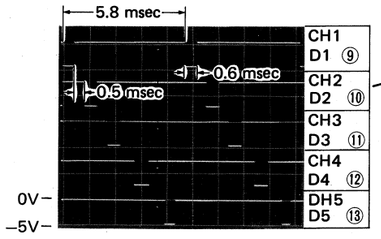
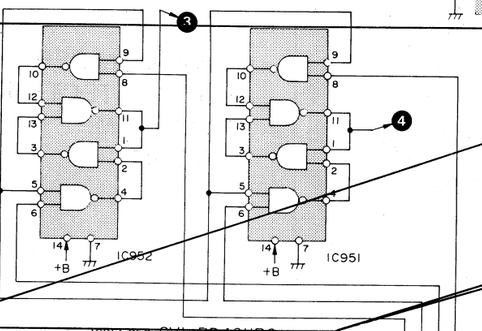


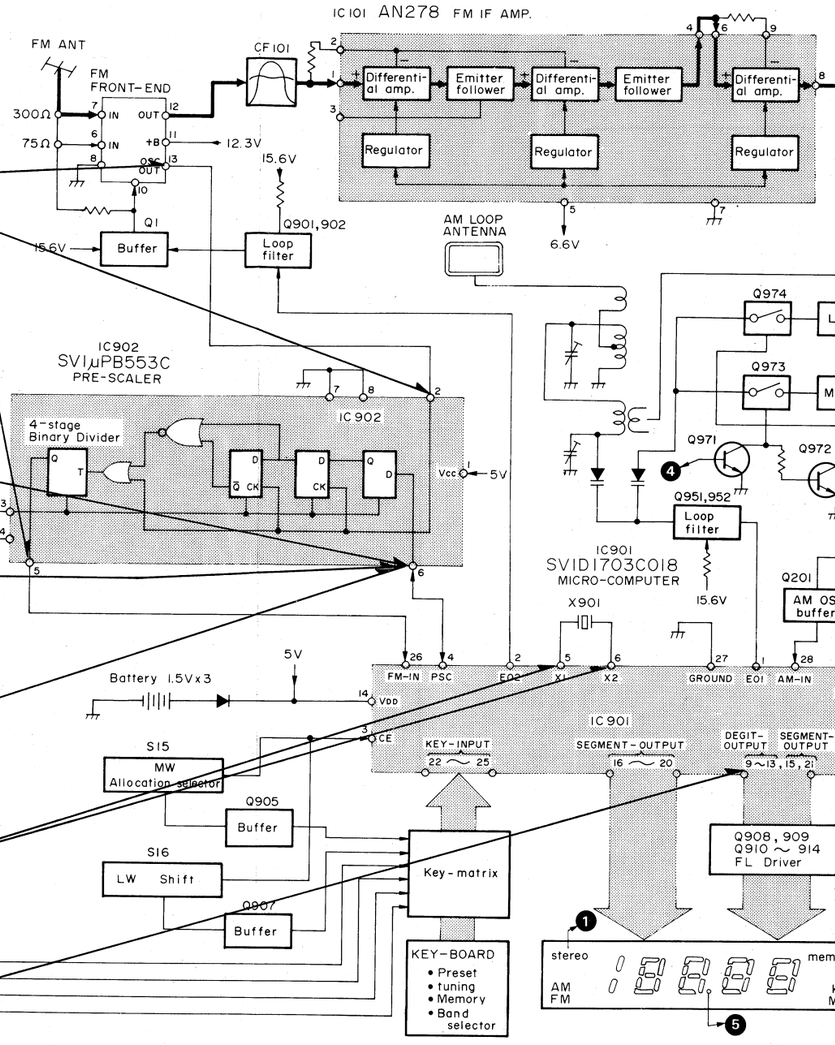
CF101, CF102 → Red



2 V/DIV 10 μsec/cm
(FL display tuned to 100.50 MHz)







• How to check FM front-end

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2. Check the waveform to see that the FM local oscillation circuit of terminal ⑬ is normal.
3. Check that the voltage at terminal ⑫ is DC 11.5V. (11.5V in FM and 0V in AM)
4. After cutting off the line between terminals ⑫ and CF101 terminal ①.
   Make sure that the output waveform is Fig. 7 when the signal of FM-SG (10.7 MHz, 400 Hz, 26 dB) is directly applied to terminal ① of CF101.

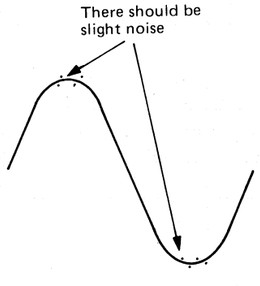
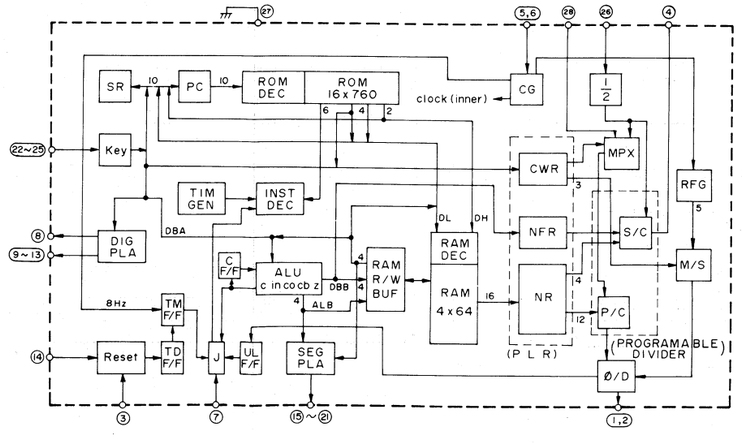
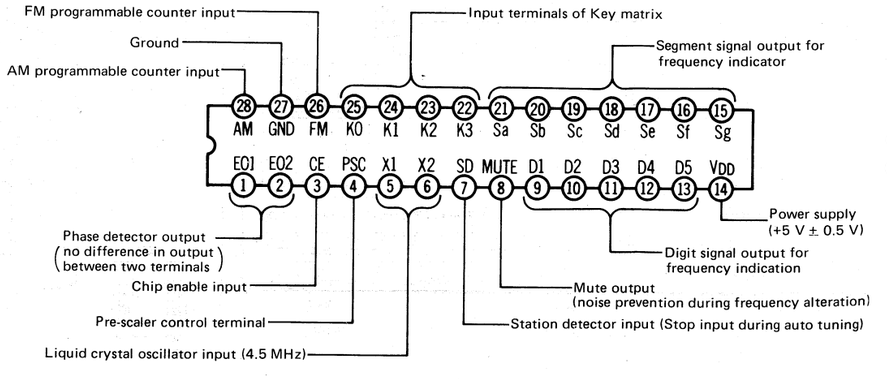


Fig. 7

• Block diagram of SVID1703CO18 (IC901)



• Description of IC terminal function (SVID1703C018)



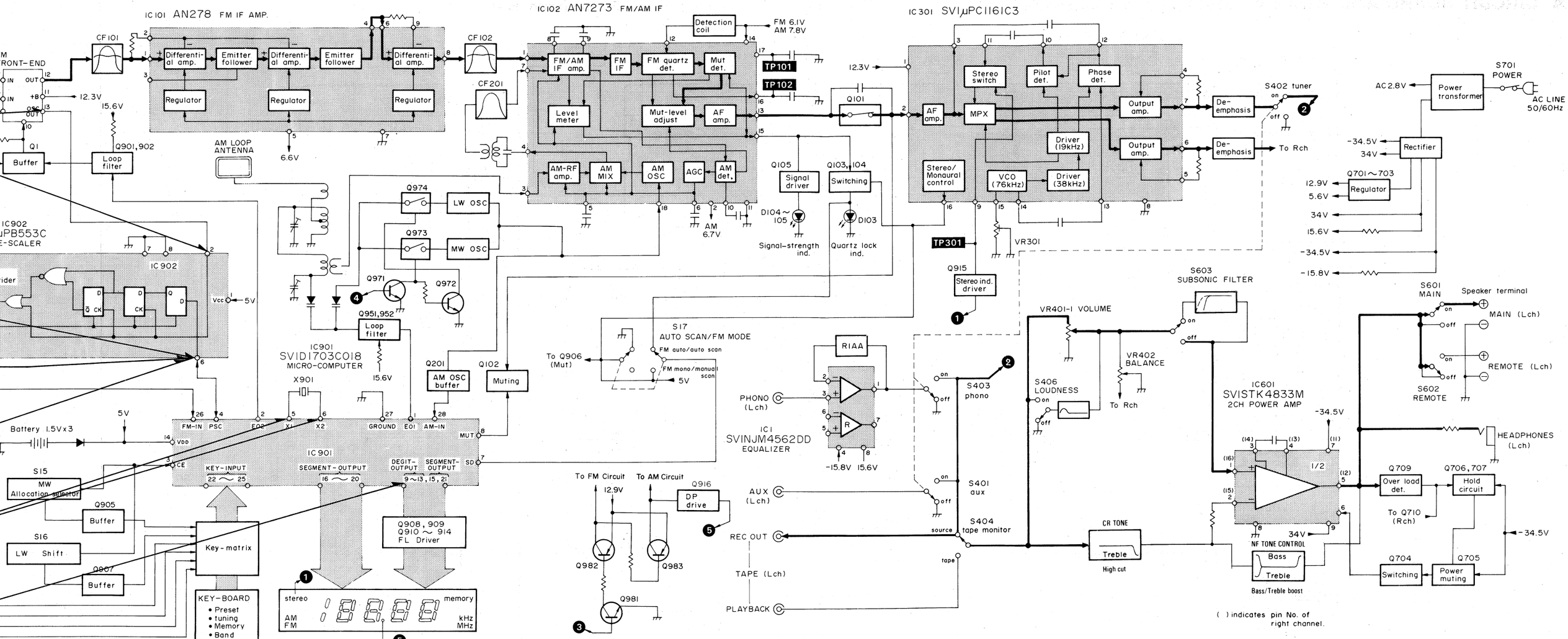
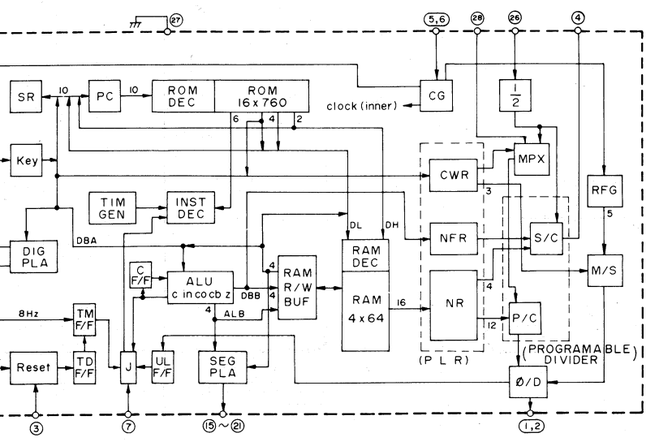
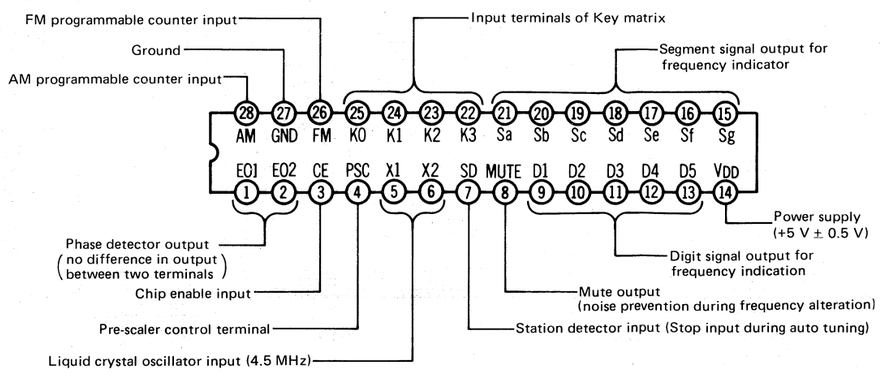


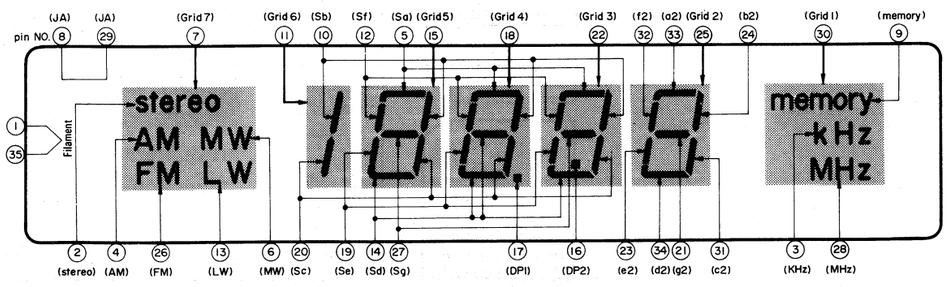
diagram of SVID1703CO18 (IC901)



• Description of IC terminal function (SVID1703C018)


FM programmable counter input
Ground
AM programmable counter input
Input terminals of Key matrix
Segment signal output for frequency indicator
AM GND FM KO K1 K2 K3 Sa Sb Sc Sd Se Sf Sg
EO1 EO2 CE PSC X1 X2 SD MUTE D1 D2 D3 D4 D5 VDD
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Power supply (+5 V ± 0.5 V)
Digit signal output for frequency indication
Phase detector output (no difference in output between two terminals)
Chip enable input
Mute output (noise prevention during frequency alteration)
Pre-scaler control terminal
Station detector input (Stop input during auto tuning)
Liquid crystal oscillator input (4.5 MHz)

• Fluorescent Display Tube (FL)



■ RESISTOR & CAPACITOR

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. This " **S** " mark is service standard parts and may differ from production parts.
5. Unless otherwise specified.
   All resistors are in OHMS (Ω) K = 1000Ω , M = 1000kΩ
   All capacitors are in MICROFARADS (μF) P = μμF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERX	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

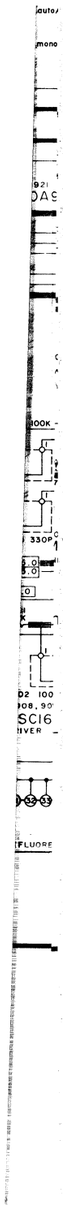
Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	G : ± 2%
ERG : Metal Oxide	12 : 1/2W	J : ± 5%
ERO : Metal Film	25 : 1/4W	
ERQ : Fuse Type Metal	1 : 1W	
ERX : Metal Film	S1 : 1/2W	
	2 : 2W	
	2F : 1/4W	

Ref. No.		Part No.	Value
RESISTORS			
R1, 2		ERD10TLJ391U	390
R3, 4		ERO10MKG2213	221K
R5, 6		ERO10MKG5622	56.2K
R7, 8		ERD10TLJ271U	270
R9, 10		ERD10TLJ680U	68
R11, 12		ERD10TLJ184U	180K
R13, 14		ERD10TLJ123U	12K
R15, 16		ERD10TLJ563U	56K
R17, 18		ERD10TLJ102U	1K
R61	⚠	ERDS1FJ823	82K
R62	⚠	ERDS1FJ273	27K
R63	⚠	ERDS1FJ682	6.8K
R64	S	ERD25FJ562	5.6K
R65	⚠ S	ERD2FCG470	47
R101, 102	S	ERD25FJ331	330
R103	S	ERD25FJ221	220
R104	S	ERD25FJ391	390
R105	S	ERD25FJ102	1K
R106	S	ERD25FJ331	330
R107	S	ERD25FJ221	220

Ref No.		Part No.	Value
R108	S	ERD25FJ472	4.7K
R109	S	ERD25FJ272	2.7K
R110	S	ERD25FJ103	10K
R111, 112	S	ERD25TJ104	100K
R113	S	ERD25FJ103	10K
R115	S	ERD25TJ473	47K
R116	S	ERD25TJ223	22K
R117	S	ERD25FJ472	4.7K
R118	S	ERD25TJ824	820 K
R119	S	ERD25FJ681	680
R120	S	ERD25FJ181	180
R121	S	ERD25FJ102	1K
R122	S	ERD25FJ681	680
R123	S	ERD25FJ151	150
R124	S	ERD25FJ100	10
R125	S	ERD25FJ221	220
R126	S	ERD25FJ101	100
R127	S	ERD25FJ102	1K
R128	S	ERD25FJ682	6.8K
R129	S	ERD25FJ222	2.2K
R131	S	ERD25TJ824	820K
R201	S	ERD25FJ472	4.7K

Ref. No.		Part No.	Value
R203	S	ERD25TJ104	100K
R205	S	ERD25TJ684	680K
R206	S	ERD25FJ562	5.6K
R207	S	ERD25FJ102	1K
R208	S	ERD25FJ103	10K
R209	S	ERD25FJ331	330
R251	S	ERD25FJ103	10K
R252	S	ERD25FJ102	1K
R253	S	ERD25FJ103	10K
R254	S	ERD25FJ102	1K
R255, 256	S	ERD25FJ472	4.7K
R257	S	ERD25FJ122	1.2K
R258	S	ERD25FJ103	10K
R259	S	ERD25FJ562	5.6K
R260	S	ERD25FJ470	47
R301	S	ERD25TJ104	100K
R302	⚠	ERD2FCG470	47
R303	S	ERD25TJ273	27K
R304	S	ERD25TJ334	330K
R305, 306	S	ERD25TJ223	22K
R307, 308	S	ERD25FJ332	3.3K
R309, 310	S	ERD25TJ104	100K

Ref No.		Part No.	Value
R311	S	ERD25TJ333	33K
R312	S	ERD25FJ472	4.7K
R313	S	ERD25FJ102	1K
R314	S	ERD25TJ123	12K
R315	S	ERD25TJ473	47K
R401, 402	S	ERD25FJ222	2.2K
R403, 404	S	ERD25TJ393	39K
R405, 406	S	ERD25TJ183	18K
R411, 412	S	ERD25FJ472	4.7K
R413, 414	S	ERD25FJ472	4.7K
R415, 416	S	ERD25TJ394	390K
R417, 418	S	ERD25TJ104	100K
R501, 502	S	ERD25FJ122	1.2K
R503, 504	S	ERD25FJ392	3.9K
R505, 506	S	ERD25TJ223	22K
R507, 508	S	ERD25TJ824	820K
R601, 602	S	ERD25TJ823	82K
R603, 604	S	ERD25TJ823	82K
R605, 606	S	ERD25FJ102	1K
R607, 608	S	ERD25FJ181	180
R609, 610	S	ERD25FJ392	3.9K
R611, 612	S	ERD25TJ473	47K



Ref No.		Part No.	Value
613, 614	S	ERD25TJ393	39K
615, 616	S	ERD25TJ393	39K
617, 618	S	ERD25FJ222	2.2K
619, 620	S	ERD25FJ272	2.7K
621	S	ERD25FJ822	8.2K
622	⚠ S	ERD25FJ101	100
623, 624	⚠	ERDS1FJ100	10
627, 628	⚠	ERDS1FJ331	330
629	⚠ S	ERD25FJ101	100
702	⚠ S	ERD25FJ561	560
703	⚠	ERDS1FJ102	1K
704	⚠	ERDS1FJ152	1.5K
705, 706	S	ERD25FJ221	220
707	S	ERD25FJ101	100
708	⚠ S	ERQ12HJ150	15
709	⚠ S	ERD25FJ122	1.2K
710	S	ERD25FJ821	820
711	⚠ S	ERG2ANJ391	390
712	S	ERD25FJ681	680
713	S	ERD25FJ272	2.7K
714	S	ERD25FJ332	3.3K
715	⚠	ERQ1ANJ152	1.5K

Ref No.		Part No.	Value
R716	S	ERD25TJ823	82K
R717	S	ERD25TJ104	100K
R718	S	ERD25TJ274	270K
R719	S	ERD25TJ223	22K
R720	S	ERD25FJ103	10K
R721	S	ERD25TJ473	47K
R722	S	ERD25FJ103	10K
R723	S	ERD25FJ562	5.6K
R724	⚠	ERDS1FJ272	2.7K
R725, 726	S	ERD25FJ103	10K
R727, 728	S	ERD25TJ153	15K
R729, 730	S	ERD25FJ222	2.2K
R731, 732	⚠ S	ERX2ANJR22	0.22
R733	S	ERD25FJ222	2.2K
R734	S	ERD25FJ101	100
R901	S	ERD25FJ102	1K
R902	S	ERD25FJ561	560
R903	S	ERD25FJ682	6.8K
R904	S	ERD25TJ224	220K
R906	S	ERD25TJ104	100K
R908, 909	S	ERD25TJ104	100K
R910	S	ERD25TJ104	100K

Ref No.		Part No.	Value
R912, 913	S	ERD25TJ223	22K
R914, 915	S	ERD25TJ223	22K
R916, 917	S	ERD25TJ223	22K
R918	S	ERD25TJ223	22K
R919	S	ERD25TJ104	100K
R920	S	ERD25TJ333	33K
R921	S	ERD25TJ104	100K
R922	S	ERD25FJ561	560
R923	S	ERD25TJ224	220K
R924	S	ERD25TJ104	100K
R925	S	ERD25FJ103	10K
R926	S	ERD25FJ221	220
R927	S	ERD25TJ104	100K
R928	S	ERD25TJ824	820K
R929, 930	S	ERD25FJ102	1K
R951	S	ERD25FJ102	1K
R952	S	ERD25FJ392	3.9K
R953	S	ERD25TJ153	15K
R954	S	ERD25FJ471	470
R971	S	ERD25TJ473	47K
R972, 973	S	ERD25TJ333	33K
R974	S	ERD25FJ222	2.2K

Numbering System of Capacitor

Example

ECKD	1H	102	K	Z
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type			Voltage: ECEA Type			Voltage: Others			Tolerance		
ECEA	:	Electrolytic	OJ	:	6.3V	1H	:	50V DC	C	:	± 0.25pF
ECEA. . . N	:	Non Polar Electrolytic	1A	:	10V	2H	:	500V DC	J	:	± 5%
ECCD	:	Ceramic	1C	:	16V	MY	:	125V AC	K	:	± 10%
ECKD	:	Ceramic	1E	:	25V	KC	:	400V AC	Z	:	+80%, –20%
ECQM	:	Polyester	1H	:	50V				P	:	+100%, –0%
ECQP	:	Polypropylene	1J	:	63V						
ECET	:	Electrolytic	50	:	50V						
ECQE	:	Polyester	25	:	25V						

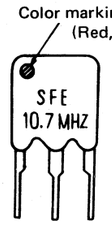
Ref No.		Part No.	Value
CAPACITORS			
C1, 2	S	ECEA50M3R3R	3.3
C3, 4	S	ECCD1H101K	100p
C5, 6	S	ECKD1H471KB	470p
C7, 8	S	ECQM1H223JZ	0.022
C9, 10	S	ECQM1H682JZ	0.0068
C11, 12	⚠	ECEA1HN010S	1
C13, 14	S	ECEA1CS330	33
C65, 66	S	ECEA1ES101	100
C67	S	ECKD1H103ZF	0.01
C70	S	ECKD1H102ZF	0.001
C71	S	ECEA50Z3R3	3.3
C72	S	ECKD1H223ZF	0.022
C73, 74	S	ECKD1H102ZF	0.001
C75	S	ECKD1H102ZF	0.001
C76	S	ECKD1H103ZF	0.01
C101	S	ECKD1H223ZF	0.022
C102, 103	S	ECKD1H103ZF	0.01
C104, 105	S	ECQM1H103JZ	0.01
C106	S	ECKD1H223ZF	0.022
C107	S	ECCD1H101KC	100p
C108	S	ECQM1H223JZ	0.022
C109	S	ECEA50Z1	1
C110, 111	S	ECKD1H103ZF	0.01
C112	S	ECEA25Z4R7	4.7
C113	S	ECEA1CS330	33
C114	S	ECEA50Z3R3	3.3

Ref
C115
C116
C117
C118
C119
C121
C202
C204
C205
C206
C207
C208
C209
C210
C251
C252
C253
C254,
C301
C302
C303
C304,
C306
C307,
C309
C310
C311

Ref No.		Part No.	Value
CAPACITORS			
C1, 2	S	ECEA50M3R3R	3.3
C3, 4	S	ECCD1H101K	100p
C5, 6	S	ECKD1H471KB	470p
C7, 8	S	ECQM1H223JZ	0.022
C9, 10	S	ECQM1H682JZ	0.0068
C11, 12	⚠	ECEA1HN010S	1
C13, 14	S	ECEA1CS330	33
C65, 66	S	ECEA1ES101	100
C67	S	ECKD1H103ZF	0.01
C70	S	ECKD1H102ZF	0.001
C71	S	ECEA50Z3R3	3.3
C72	S	ECKD1H223ZF	0.022
C73, 74	S	ECKD1H102ZF	0.001
C75	S	ECKD1H102ZF	0.001
C76	S	ECKD1H103ZF	0.01
C101	S	ECKD1H223ZF	0.022
C102, 103	S	ECKD1H103ZF	0.01
C104, 105	S	ECQM1H103JZ	0.01
C106	S	ECKD1H223ZF	0.022
C107	S	ECCD1H101KC	100p
C108	S	ECQM1H223JZ	0.022
C109	S	ECEA50Z1	1
C110, 111	S	ECKD1H103ZF	0.01
C112	S	ECEA25Z4R7	4.7
C113	S	ECEA1CS330	33
C114	S	ECEA50Z3R3	3.3
C115	S	ECEA50Z1	1
C116	S	ECEA1AS470	47
C117	S	ECEA50Z3R3	3.3
C118	S	ECKD1H103ZF	0.01
C119	S	ECCD1H560K	56p
C121	S	ECKD1H103ZF	0.01
C202	S	ECKD1H223ZF	0.022
C204	S	ECCD1H150KC	15p
C205	S	ECKD1H223ZF	0.022
C206	S	ECEA1AS101	100
C207	S	ECEA25Z4R7	4.7
C208	S	ECEA1HS100	10
C209	S	ECKD1H103ZF	0.01
C210	S	ECQM1H473JZ	0.047
C251		ECQP1271JZ	270p
C252		ECQP1471JZ	470p
C253	S	ECCD1H101KC	100p
C254, 255	S	ECQM1H223JZ	0.022
C301	S	ECEA1CSS221	220
C302	S	ECQM1H473JZ	0.047
C303	S	ECCD1H470K	47p
C304, 305	S	ECEA50ZR47	0.47
C306	S	ECEA50ZR47	0.47
C307, 308	S	ECQM1H153JZ	0.015
C309	S	ECKD1H223ZF	0.022
C310	S	ECEA50Z1	1
C311	S	ECEA50Z3R3	3.3
C312	S	ECQP1471JZ	470p
C313	S	ECKD1H103ZF	0.01
C314	S	ECKD1H223ZF	0.022
C401, 402	S	ECKD1H331KB	330p
C403, 404	S	ECQM1H563JZ	0.056
C501, 502	S	ECQM1H223JZ	0.022
C503, 504	S	ECQM1H183JZ	0.018
C505, 506	S	ECQM1H104JZ	0.1
C601, 602	S	ECQM1H823JZ	0.082
C603, 604	S	ECEA50Z2R2	2.2
C605, 606	S	ECCD1H390K	39p
C607, 608	S	ECKD1H102KB	0.001
C609, 610	S	ECCD1H330K	33p
C611, 612	S	ECEA25Z4R7	4.7
C613, 614	S	ECCD1H1R5C	1.5
C615, 616	S	ECEA50Z3R3	3.3
C619, 620	⚠	ECEA1HN3R3S	3.3
C621	S	ECQM1H103JZ	0.01
C622	S	ECKD2H102ZF	0.001
C623	S	ECEA1HS470	47
C624	S	ECCD1H010CC	1p
C625	S	ECKD1H103ZF	0.01
C701	⚠	ECKDKC103PF	0.01
C702, 703	S	ECETS40V682U	6800
C704	⚠ S	ECKD2H103PE	0.01
C705	S	ECEA1HS101	100
C706	S	ECEA1ES221	220
C708	S	ECEA1ES101	100
C709	S	ECKD1H103ZF	0.01
C710	S	ECEA1HS100	10
C711	S	ECKD1H103ZF	0.01
C712, 713	S	ECEA2AS100	10
C714	S	ECEA50Z3R3	3.3
C715	S	ECEA1HS470	47
C717	S	ECEA1HS470	47
C730	S	ECKD1H223ZF	0.022
C901	S	ECKD1H103ZF	0.01
C902	S	ECEA50M4R7R	4.7
C903, 904	S	ECKD1H103ZF	0.01
C905	S	ECCD1H180KC	18p
C906	S	ECCD1H150KC	15p
C907	S	ECEA0JS102	1000
C908	S	ECEA0JS471	470
C909	S	ECEA1HS470	47
C910	⚠	ECEA1HN010S	1
C911	S	ECEA1ES470	47
C912	S	ECKD1H103ZF	0.01
C913, 914	S	ECKD1H223ZF	0.022
C951	S	ECQM1H273JZ	0.027
C952	S	ECEA50ZR33	0.33
C953	S	ECCD1H560K	56p
C954	S	ECKD1H103ZF	0.01
C971	S	ECKD1H223ZF	0.022
C1002		ECQE1104KN	0.1

- **Use of ceramic filters in pairs**
  The ceramic filters (CF101, CF102) for FM-1F circuit are available in three ranks. For this machine, be sure to use the ceramics of the same rank in a pair.

At repairing and replacement, pay close attention to the diodes (D907, D908) for use as different diodes must be used depending on each rank of the ceramic filters.



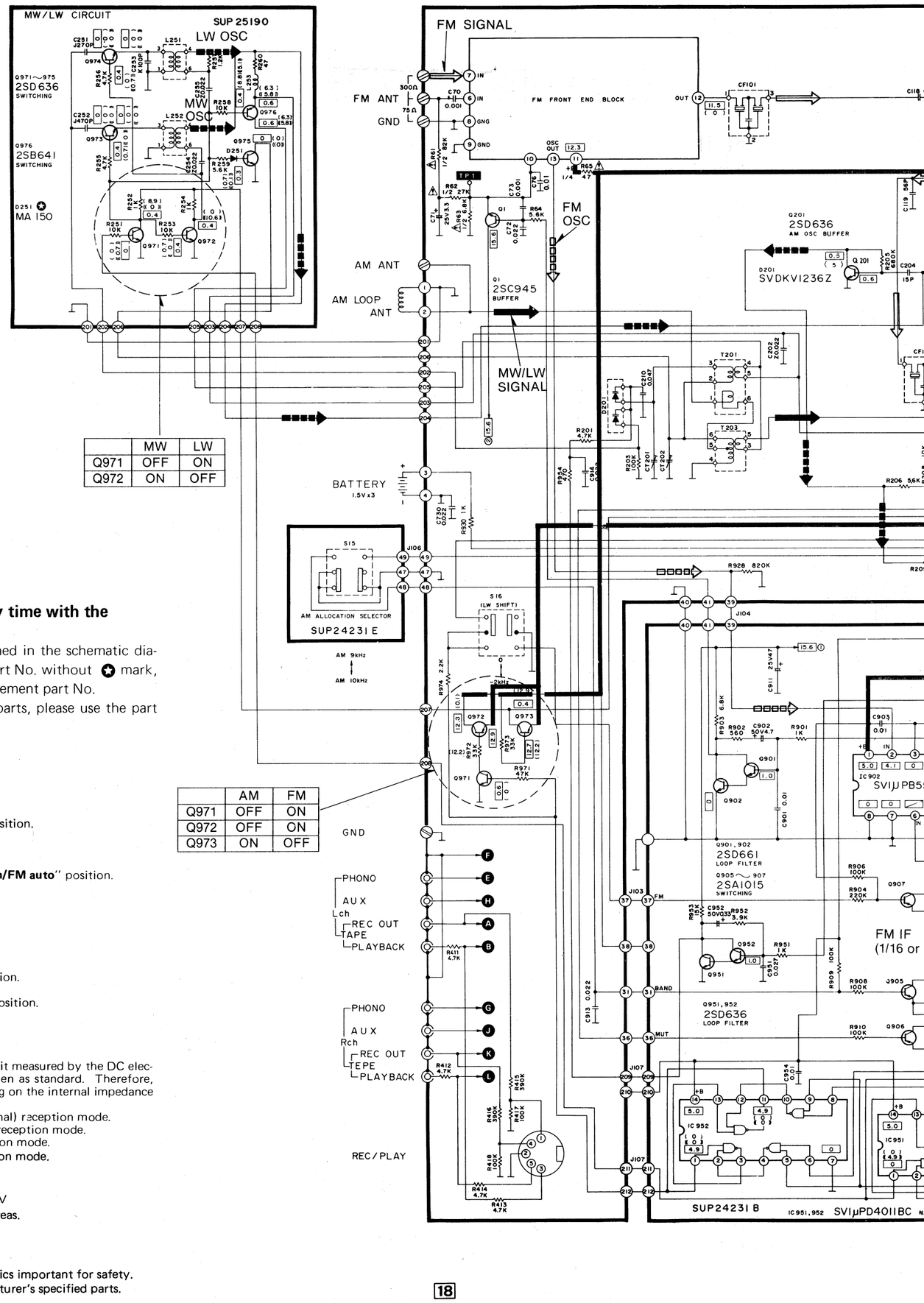
RANK (color)	D907
Red	X
Orange	X
Blue	O

Note: O
X

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. without ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.



	MW	LW
Q971	OFF	ON
Q972	ON	OFF

	AM	FM
Q971	OFF	ON
Q972	OFF	ON
Q973	ON	OFF

Notes:

1. **S1** : Tuning "**down**" switch.
2. **S2** : Tuning "**up**" switch.
3. **S3** : Memory set switch.
4. **S4 ~ S9** : FM/AM Preset tuning switch.
5. **S15** : AM allocation switch in "**10 kHz step**" position.
   AM 10 kHz ⟷ AM 9 kHz
6. **S16** : Band selector switch in "**FM**" position.
   FM ⟷ AM
7. **S17** : Auto scan/FM mode selector switch in "**on/FM auto**" position.
   on/FM auto ⟷ off (manual)/FM mono.
8. **S401 ~ S403** : Input selector switch in "**tuner**" position.
   S401 : aux, S402 : tuner, S403 : phono.
9. **S404** : Tape monitor switch in "**source**" position.
   source ⟷ tape
10. **S406** : Loudness switch in "**off**" position.
    off ⟷ on
11. **S601** : Main speaker selector switch in "**on**" position.
    off ⟷ on
12. **S602** : Remote speaker selector switch in "**off**" position.
    off ⟷ on
13. **S603** : Subsonic filter switch in "**off**" position.
    off ⟷ on
14. **S701** : Power source switch in "**on**" position.
15. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    * Figures in ☐ stand for DC voltage in FM signal (no signal) reception mode.
    * Figures in < > stand for DC voltage in FM stereo signal reception mode.
    * Figures in ( ) stand for DC voltage in AM signal reception mode.
    * Figures in (( )) stand for DC voltage in LW signal reception mode.
    * Figures in ▨ H → 5V : L → 0 V.
16. ▬▬ Positive voltage lines ▒▒ AF signal lines
    ▬ ▬ ▬ Negative voltage lines ▬ H⟶ 5V L⟶ −23V
17. The power supply for this unit varies depending upon the areas.
    220V (50/60 Hz) for Continental Europe.
    240V (50/60 Hz) for United Kingdom.
18. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety.
    When replacing any of these components, use only manufacturer's specified parts.

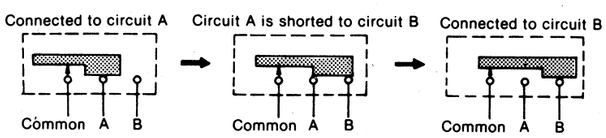
ange)

RANK (color)	D907	D908	CENTER FREQUENCY
Red	X	X	10.70 MHz
Orange	X	O	10.73 MHz
Blue	O	O	10.67 MHz

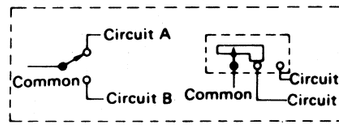
Note: O Mark Diode is used.
X Mark Diode is not used.

Shorting Switch

This unit uses a shorting switch. As illustated below, the circuit is shorted to the next circuit without being opened.
In the circuit diagram, the shaded area represents the common terminal.



An example of circuit diagram



TUNER CIRCUIT

D102, 202, 301, 302 ✪MA150

IC 101 AN278 FM IF AMP

Q103 2SC1685 SWITCHING

Q104 2SA1015 SWITCHING

Q201 2SD636 AM OSC BUFFER

D201 SVDKV1236Z

D101 MA27WA

IC-102 AN7273 FM AM IF

IC 301 AN7470 MPX

Q101 SWICHING
Q102 MUTING
2SC1685

VCO adj.

19kHz OUTPUT

S401 (AUX)
S402 (TUNER)
S403 (PHONO)
(TAPE MONITOR)
source → tape

SUP24231D

EQUALIZER CIRCUIT

IC1 SVINJM4562DD EQUALIZER

SUP24310

SUP24231A

FM auto/auto scan
FM mono/manual scan
S17 (AUTO SCAN/FM MODE)

IC 902 SVIμPB553C-E

IC 901 SVIDI703C-018 MICRO COMPUTER

D922 SVDMZ306B

FM IF (1/16 or 1/17)

Z901 100K X

Z902 100K X 7
Q908, 909
2SC1685
DRIVER

Z903 330P

Q910~916
2SA1015
DRIVER

FL DISPLAY (FLUORESCENT DISPLAY TUBE)

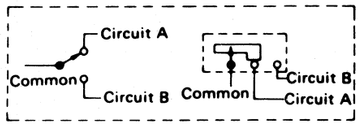
D903~905, 907~919, 923, 951~960
✪MA150

IC951, 952 SVIμPD4011BC NAND GATE

D103 LN846RP QUARTZ LOCK & SIGNAL STRENGTH IND.
D104~106 LN446YP SIGNAL STRENGTH IND.
Q105 2SD661 SIGNAL DRIVER

SUP24231C

An example of circuit diagram

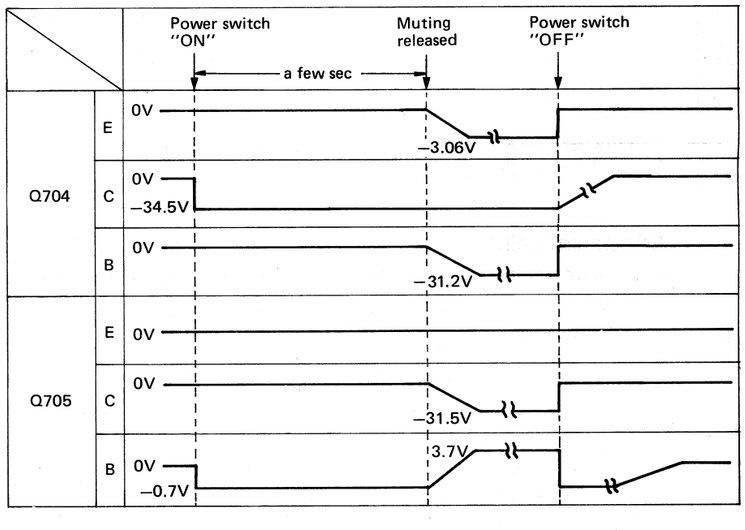


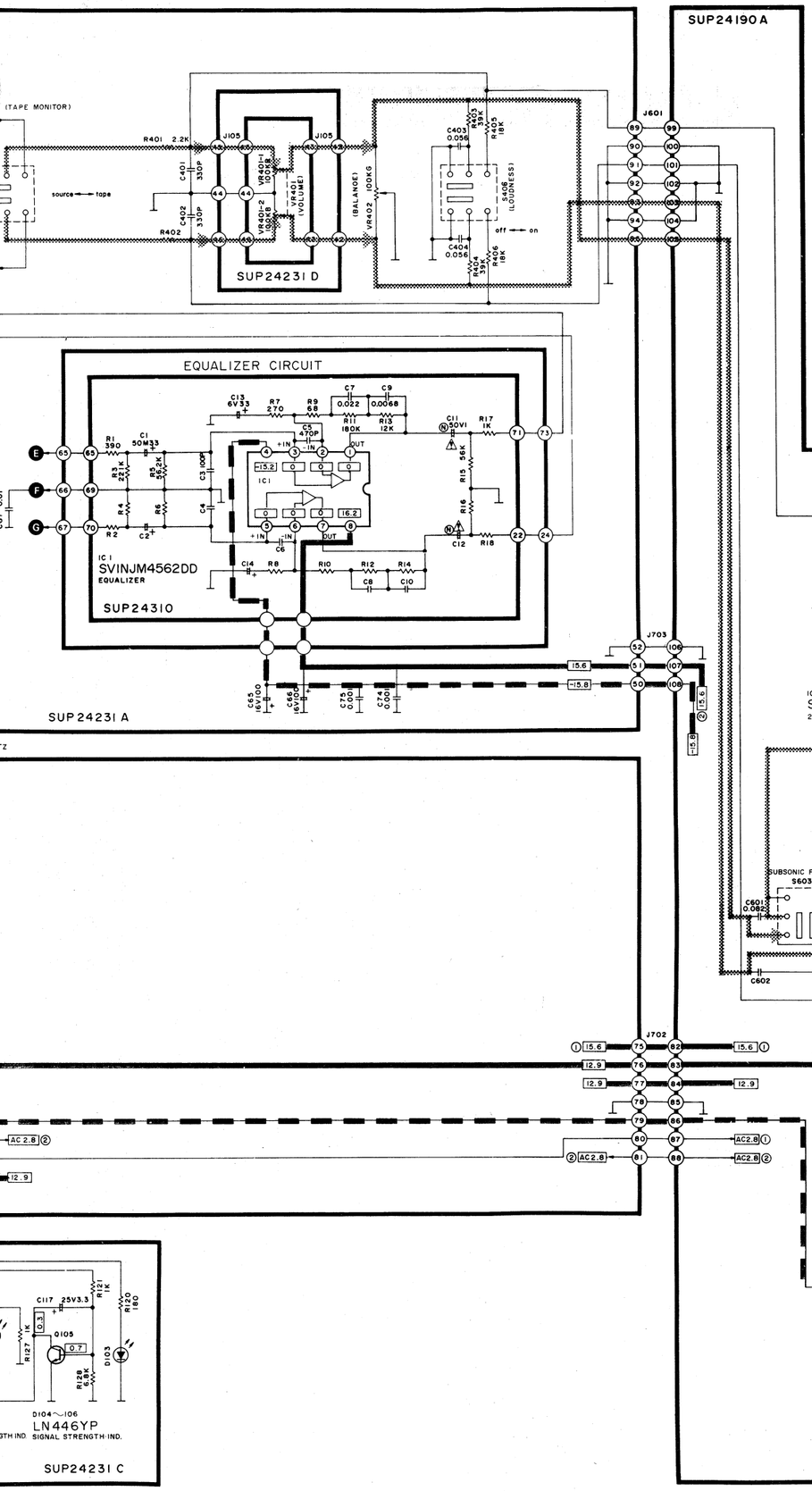
- **Transistor voltage during operation of speaker protection circuit.**

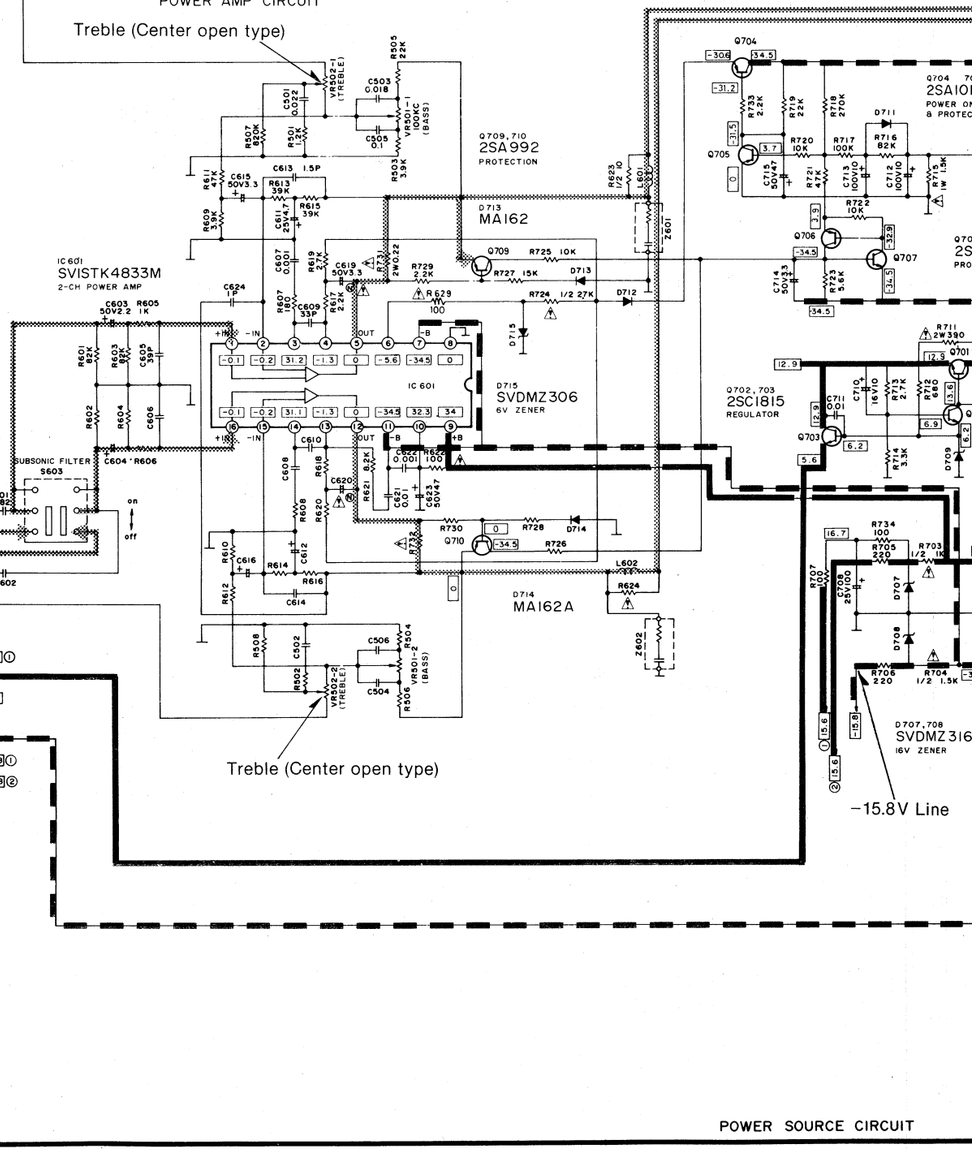
Unit : V

	Q704	Q705	Q706	Q707
E	0	0	−33.8	−34.5
C	−34.5	0	−33.8	−34.5
B	0	−0.7	−34.8	−33.8

- **Transistor voltage during power ON-OFF muting operation.**







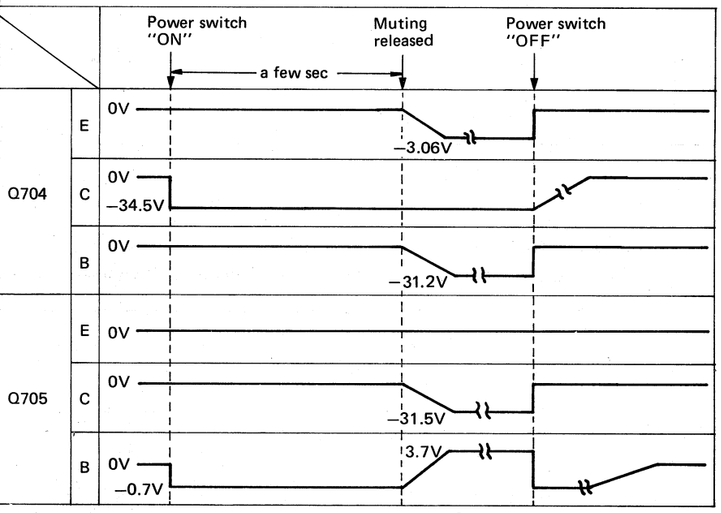
17 18 19 20 21 22 23

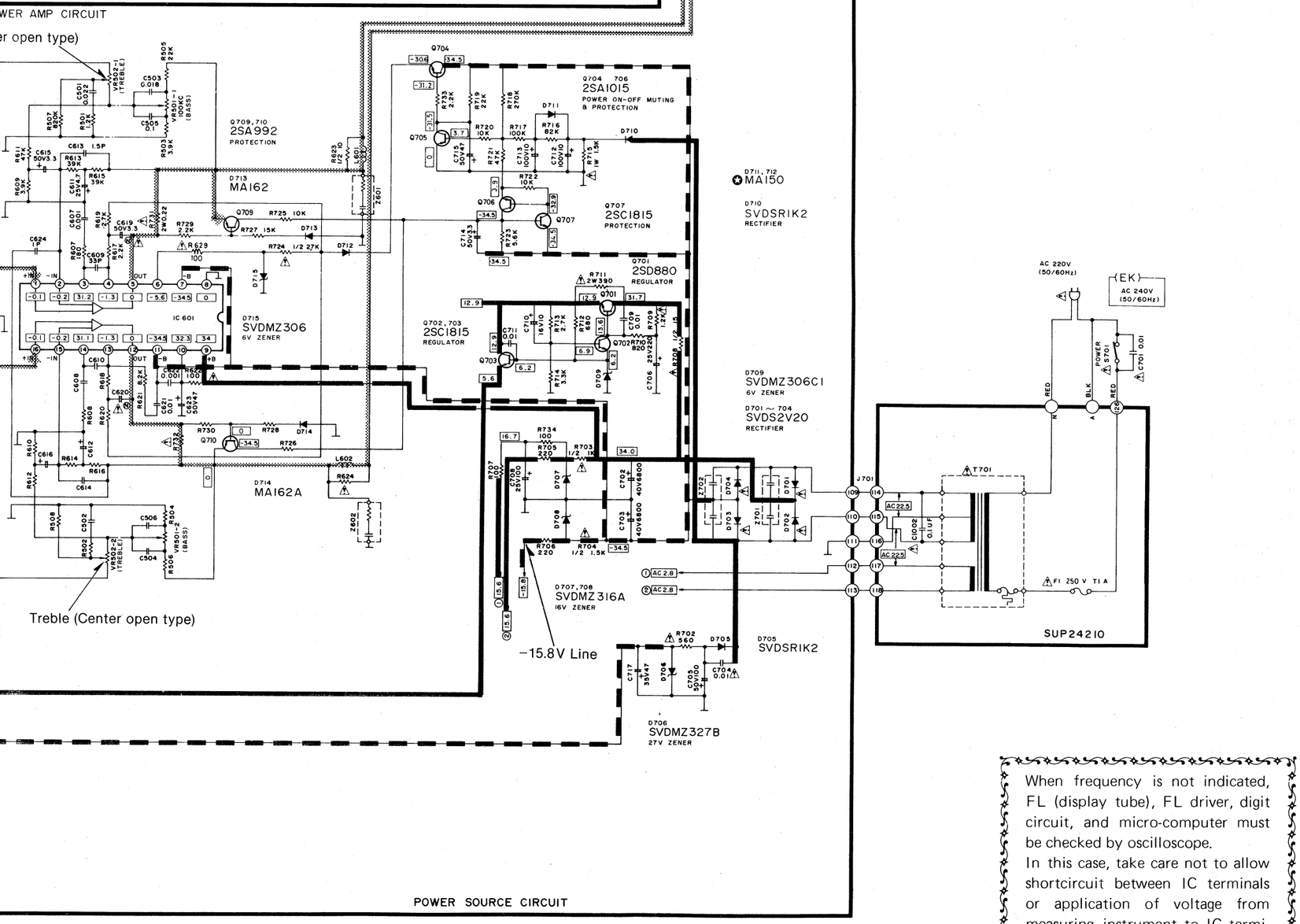
- **Transistor voltage during operation of speaker protection circuit.**

Unit : V

	Q704	Q705	Q706	Q707
E	0	0	−33.8	−34.5
C	−34.5	0	−33.8	−34.5
B	0	−0.7	−34.8	−33.8

- **Transistor voltage during power ON-OFF muting operation.**





When frequency is not indicated, FL (display tube), FL driver, digit circuit, and micro-computer must be checked by oscilloscope.
In this case, take care not to allow shortcircuit between IC terminals or application of voltage from measuring instrument to IC terminals.

■ MEASUREMENTS AND ADJUSTMENTS

AM ADJUSTMENT

• Setting and Equipment used

1. AC and DC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. Set band selector to "MW or LW" position.
4. Set AM allocation selector to "10 kHz" position.
5. Maintain line voltage at rated volts.
6. Output of signal generator should be no higher than necessary to obtain an output reading.
7. Use a non-metal screwdriver for the adjustment.

Step No.	AM SIGNAL GENERATOR CONNECTION	AM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	MW-RF ADJUSTMENT * Set band selector to "MW" position.					
1	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	610 KHz (30% Mod. with 400 Hz)	610 kHz	Connect AC VTVM or scope to "Speaker terminals" of the set.	T201 (ANT Coil)	1. Adjust for maximum output. 2. Adjust ferrite core of T201 by screwdriver.
2		1500 kHz (30% Mod. with 400 Hz)	1500 kHz	Connect AC VTVM or scope to "Speaker terminals" of the set.	CT201 (ANT Trimmer)	1. Adjust for maximum output. 2. Repeat steps (1) and (2) until the frequency correctly matches the dial display.
	LW-RF ADJUSTMENT * Set band selector to "LW" position.					
3	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	155 kHz (30% Mod. with 400 Hz)	155 kHz	Connect AC VTVM or scope to "Speaker terminals" of the set.	T203 (ANT Coil)	1. Adjust for maximum output. 2. Adjust ferrite core of T203 by screwdriver.
4		353 kHz (30% Mod. with 400 Hz)	353 kHz	Connect AC VTVM or scope to "Speaker terminals" of the set.	CT202 (ANT trimmer)	1. Adjust for maximum output. 2. Repeat steps (3) and (4) until the frequency correctly matches the dial display.

FM ADJUSTMENT

• Setting and Equipment used

1. FM signal generator (FM-SG)
2. Stereo modulator (or separation meter)
3. Distortion analyser.
4. Oscilloscope.
5. AC and DC electronic voltmeters (VTVM)
6. Frequency counter (19 kHz and 108 MHz measurable)
7. FM 300Ω dummy antenna (Fig. 8) and low-pass filter (fc : 15 kHz ~ 19 kHz)
8. Set band selector to "FM" position.
9. Set Auto scan/FM mode selector to "off (manual)/FM mono" position.
10. Other setting are the same as in AM adjustment.

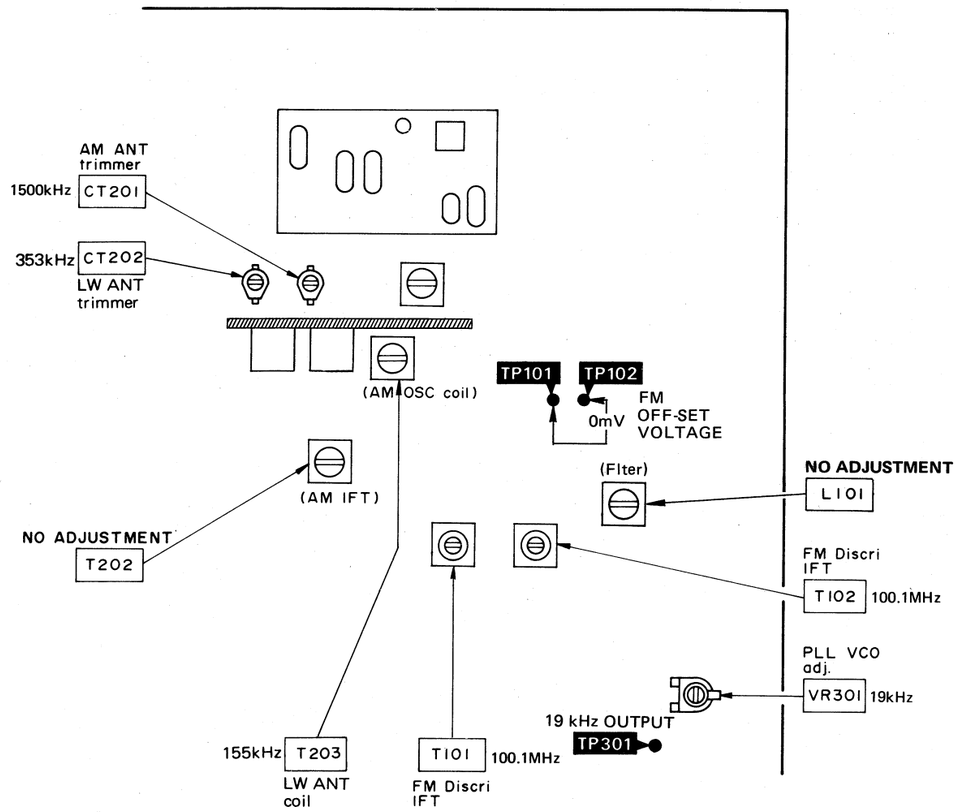
• Preparation of FM signal generator (FM-SG)

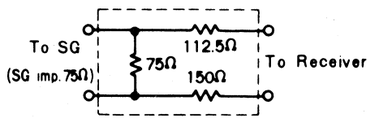
1. Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna.
2. The standard input of the set is 60 dB (1mV), 400 Hz 100% modulation (Because of using dummy antenna, SG output must be 12 dB plus (IHF). That is, when input 60 dB, SG output is to be 72 dB.)

Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	FM-IF ADJUSTMENT					
5	–	No-Signal	100.1 MHz	Connect DC VTVM to between TP101 and TP102 through choke coil. (Refer to Fig. 9)	T101 (Discri. IFT)	Adjust T101 core so that voltage measured in signal mode is 0mV in 300 mV range.
	FM MONO DISTORTION ADJUSTMENT					
6	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna. (Apply 60 dB to antenna terminal)	100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	Connect distortion analyser to "Speaker" terminals of the set.	T102 (Discri IFT)	1. Check step (3) in no signal mode. 2. If it is deflected, readjust of T101. 3. Adjust T102 core so that distortion of right and left channels are minimized.
	FM MPX PILOT (VCO) ADJUSTMENT					
7	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna.	100.1 MHz (Non-modulated)	100.1 MHz	Connect frequency counter to TP301 terminal through resistor. (100k Ω).	VR301 (VCO)	1. Set the Auto scan/FM mode selector to "on/FM auto". 2. Adjust VR301 to 19 kHz ± 30 Hz.

• Adjustment points

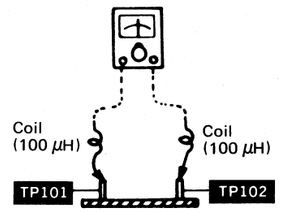
Note: AM OSC coil (L201), AM IFT (T202) and Filter (L101) have been already adjusted, and require no adjustment.





300Ω FM Dummy Antenna

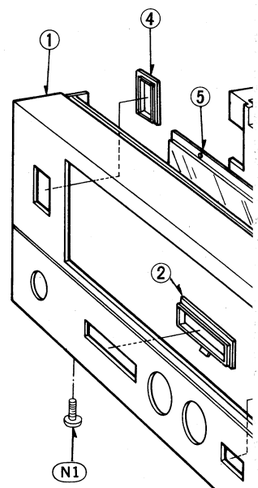
Fig. 8



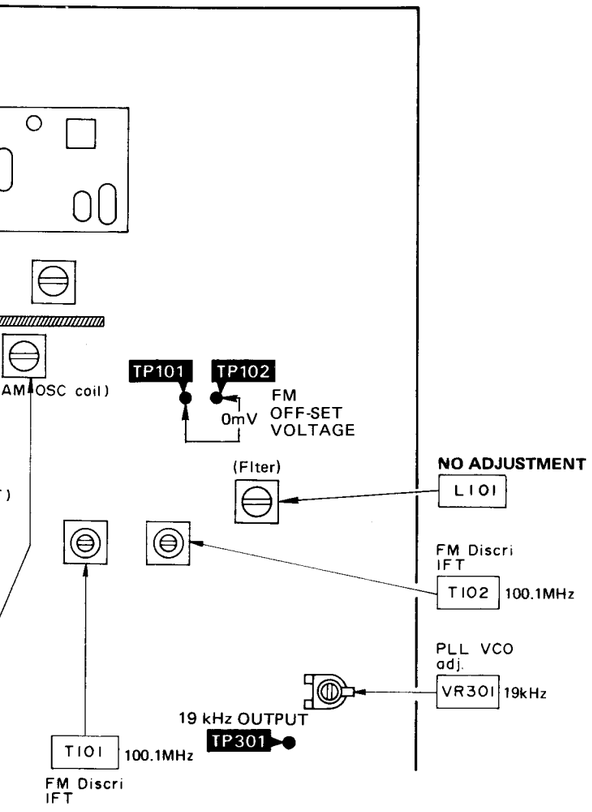
(IF voltage adjustment)

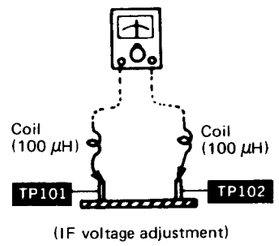
Fig. 9

■ EXPLODE



(L101) have been already adjusted, and require no adjustment.

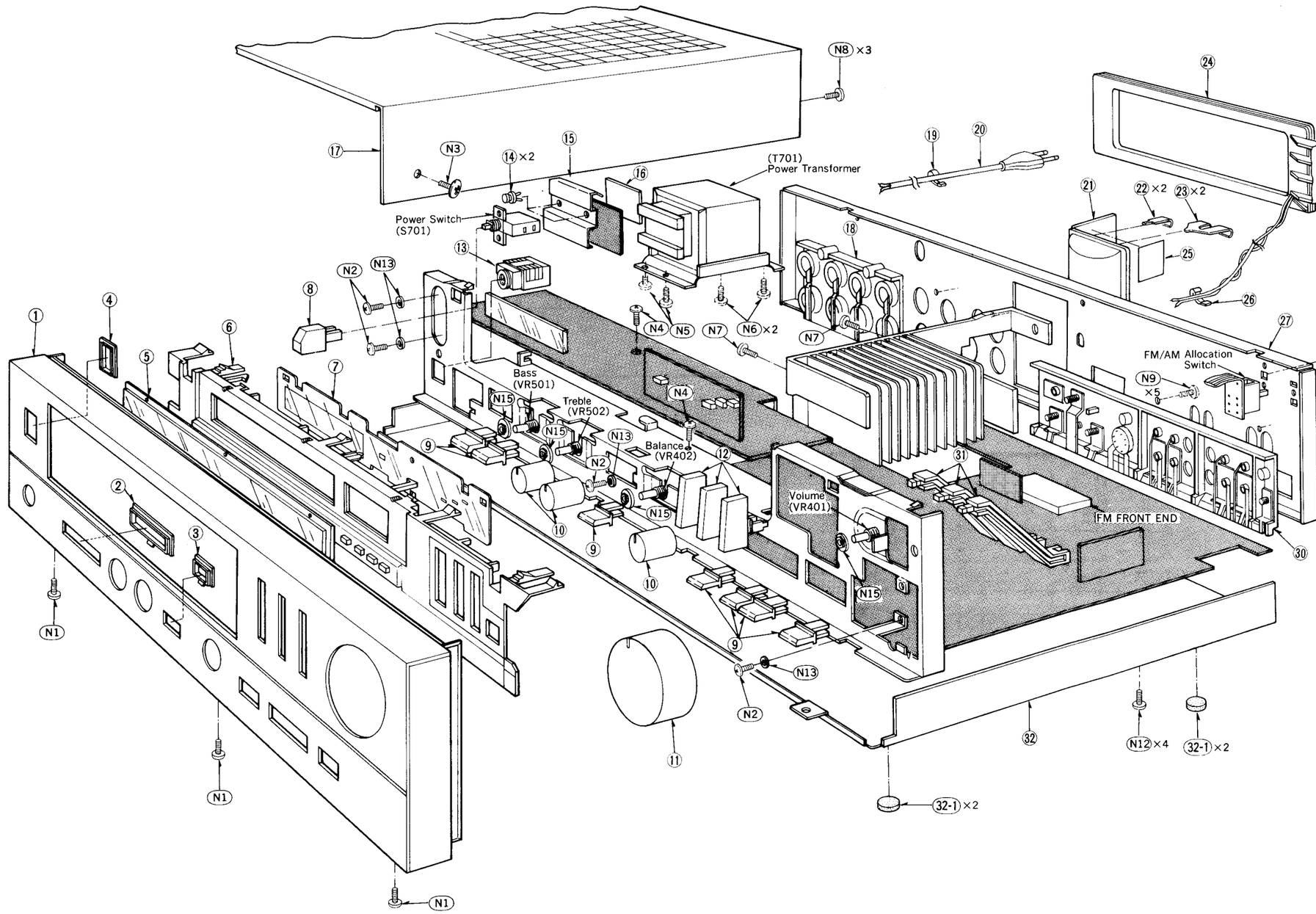


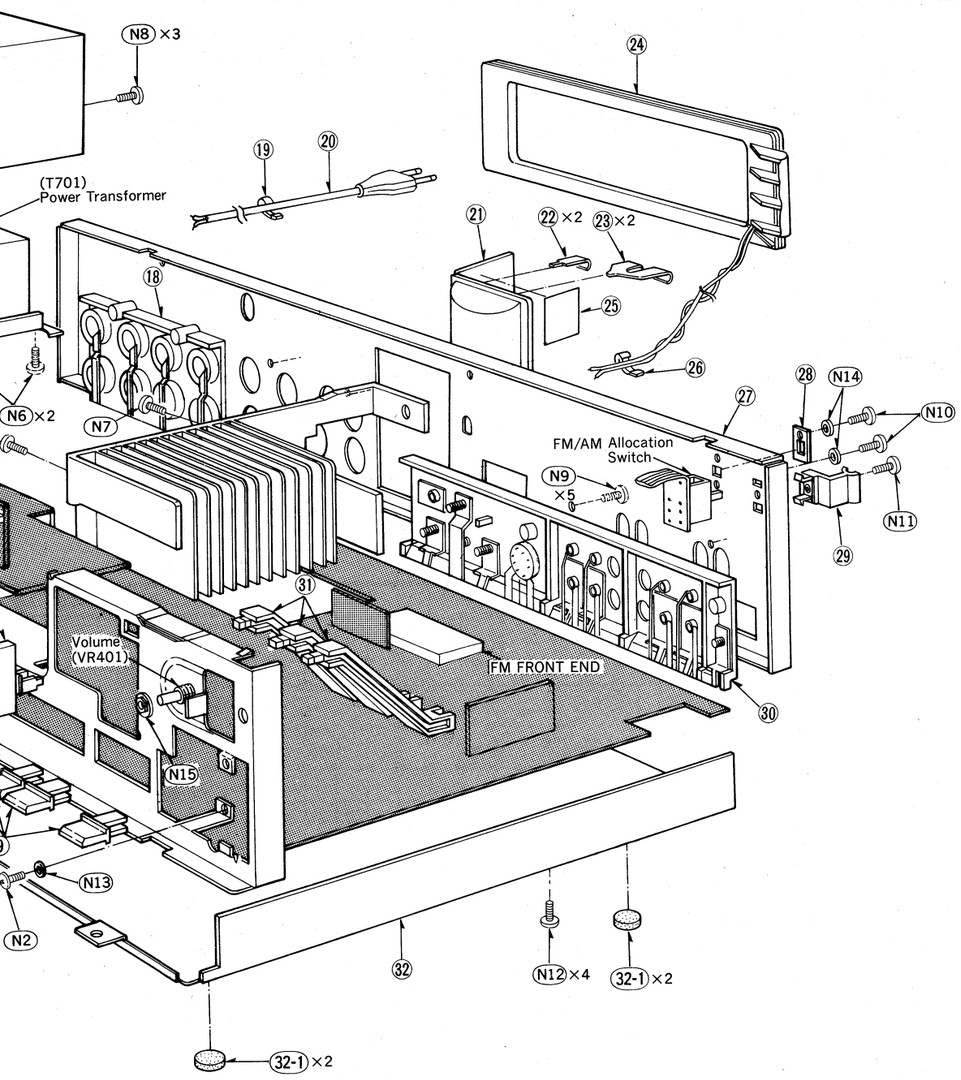


(IF voltage adjustment)

Fig. 9

■ EXPLODED VIEWS





■ REPLACEMENT PARTS LIST..... Cabinet & Chassis Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety Notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. [K] -marked parts are used for black only, while ○-marked parts are for silver type only.
4. Parts other than [K] - and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "**S**" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Black type model No. : SA-212L(K)

Areas

*** [EX] is available in Switzerland and Scandinavia.**
*** [EF] is available in France.**
*** [EB] is available in Belgium.**
*** [EK] is available in United Kingdom.**

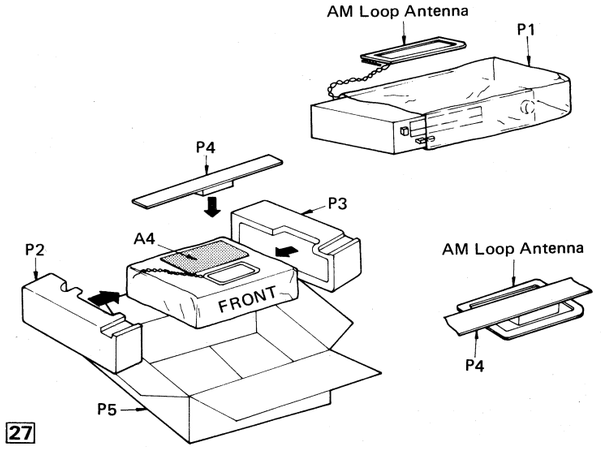
Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SGWA212LE	Front Panel Ass'y (Silver)	(1)
1	[K]	SGWA212LKE	Front Panel Ass'y (Black)	(2)
2		SGX7237	Ornament, Button	(1)
3		SGX7235	Ornament, Button	(1)
4		SGX7265	Ornament, Button	(1)
5		SGU269	Transparent Panel	(1)
6	○	SGXA212LE	Front Sub Panel Ass'y (Silver)	(1)
6	[K]	SGXA212LKE	Front Sub Panel Ass'y (Black)	(1)
7	○	SDU105	Filter (Silver)	(1)
7	[K]	SDU105–1	Filter (Black)	(1)
8		SBC337–1	Button, Power Switch	(1)
9		SBC455	Button, Push Switch	(7)
10		SBN1115	Knob, Tone Blance	(3)
11		SBN1101	Knob, Volume	(1)
12		SBC453	Button, Input	(3)
13		SJJ69–1	Jack, Head Phone	(1)
14		SHR401–1	Lock Pin, Shield Cover	(1)
15		SMX585	Shield Cover	(1)
16		SMX429	Shield Cover	(1)
17	○	SKC1010S1	Cabinet (Silver)	(1)
17 [EK] only		SKCA212LE	Cabinet (Silver)	(1)
17	[K]	SKC1010BB1	Cabinet (Black)	(1)
18		SJF4815	Terminal Board, Speaker	(1)
19		SHR127	Bushing, AC Cord	(1)
19 [EK] only		SHR129	Bushing, AC Cord	(1)
20	⚠ S	SJA88	AC Cord	(1)
20 [EK]	S ⚠	QFC1205M	AC Cord	(1)
21		SJB3005–1	Battery Case	(1)
22		SJC7	Terminal, Battery	(2)
23		SJC9	Terminal, Battery	(2)
24		SSA609	Loop Antenna	(1)
25		SGK1569–1	Lable	(1)
26		RHR111	Bushing, Loop Antenna	(1)
27[EX] only		SGP3010–1D	Rear Panel	(1)
27[EF,EB]		SGP3010–1E	Rear Panel	(1)
27[EK] only		SGP3010–1C	Rear Panel	(1)
28		SHR5025–1	Stopper, Switch	(1)
29		SMA231	Holder, Loop Antenna	(1)
30		SJF8037–2N	Terminal Board In/Out	(1)
31		SUB93	Connection Rod	(1)
32		SYUA212EX	Bottom Cover	(1)
32–1		[SKL245–2	Foot	(4)
SCREWS				
N1	S	XTB3+8BFN	Tapping, ⊕ 3 x 8	(3)
N2	S	XSN3+6S	⊕ 3 x 6	(4)
N3	○	SNE2095–2	Tapping (Silver)	(2)
N3	[K]	SNE2095–3	Tapping (Black)	(2)

Ref. No.		Part No.	Description	
N4		XTBS3+8BFZ1	Tapping with Detent	(2)
N5	S	XTB3+8BFZ	Tapping, ⊕ 3 x 8	(2)
N6	S	XTB3+10BFZ	Tapping, ⊕ 3 x 10	(2)
N7	S	XTB3+16BFN	Tapping, ⊕ 3 x 16	(2)
N8	S ○	XTB3+8BFN	Tapping, ⊕ 3 x 8	(3)
N8	S [K]	XTB3+8BFZ	Tapping, ⊕ 3 x 8	(3)
N9		XTBS3+8BFZ1	Tapping with Detent	(5)
N10	S	XSN26+5FZ	⊕ 2.6 x 5	(2)
N11	S	XTB3+10BFZ	Tapping, ⊕ 3 x 10	(1)
N12	S	XTB3+8BFZ	Tapping, ⊕ 3 x 8	(4)
WASHERS				
N13	S	XWA3BFN	Spring, ϕ3	(4)
N14	S	XWA26BFZ	Lock, ϕ3 Spring, ϕ2.6	(2)
NUTS				
N15		SNE4021	Variable Resistor	(4)

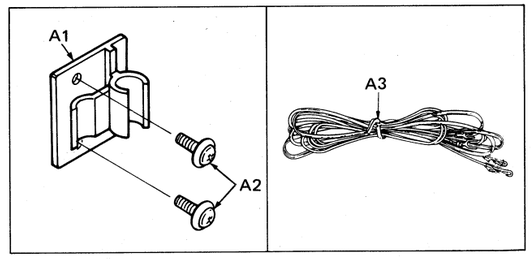
Ref. No.		Part No.	Description	
ACCESSORIES				
A1		SMA233	Holder, Loop Antenna	(1)
A2		XTN3+10AFZ	Screw, Tapping, ⊕ 3 x 10	(2)
A3		SSA267	Cord, FM Indoor Antenna	(1)
A4		SQF11227	Instructions Book	(1)
PACKING PARTS				
P1	○	SPP699	Polyethylene Bag (Silver)	(1)
P1	[K]	SPP649	Polyethylene Bag (Black)	(1)
P2		SPS3519	Pad, Left Side	(1)
P3		SPS3521	Pad, Right Side	(1)
P4		SPS3523	Pad, Upper	(1)
P5	○	SPG3933	Carton Box (Silver)	(1)
P5 [EF]	○	SPG3935	Carton Box (Silver)	(1)
P5	[K]	SPG3937	Carton Box (Black)	(1)

■ PACKINGS

* Put the FM indoor antenna and AM loop antenna base into the bag together with the instruction book.
* When packing the set, be sure to take the AM loop antenna out of the polyethylene bag (SPP699 or SPP649) beforehand.
* Fasten the power cord (AC cord) to the bottom plate of the set with tape.
* Set the styrol part of the top plate to the AM loop antenna.



• Accessories



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